# IMPUTERWOR

\$2/COPY: \$44/YEAR

VOL. XX, NO. 22



### Product Spotlight

Word processing: The power of the printed word/53

### In Depth

The rise of PCs, the fall of dedicated systems/79

### TOP OF THE NEWS

Third-party maintenance firm Sorbus, Inc. begins to reap the benefits of the deep pockets of Bell Atlantic, which acquired it 18 months ago. Page 150.

Hewlett-Packard rolls out its latest Spectrum machine, a processor that will unify its manufacturing and technical workstation lines. Page 6.

Fujitsu's U.S. subsidiary lands the first contract to supply end-user equipment for McDonald's ISDN trial. Page 2.

AT&T today is scheduled to unveil enements to its Systems 75 and 85 PBX products. Page 2.

Control requirements at the University of Michigan Hospital shape a new network management system. Page 19.

Pick-based systems help a company scoop up market share in a trailing-edge industry. Page 45.

Microsoft promises significant exten-sions to its Windows operating environment this week, including a major new communications facility and new support for dynamic exchange of real-time data between applications. A New York session (at the Windows on the World restaurant) also will highlight in-house Windows development efforts at some large

Wang Laboratories, Inc. will introduce, probably in the fall, an IBM-compatible laptop micro that features a built-in thermal printer, according to a major Wang user. "Wang is giving us a Cadillac. If it's priced aggressively, they will have a real the user predicted, adding that the unit will be offered to beta test sites in June. The laptop's 25-line LCD screen features an amber display with black letters. It is powered by the 80C86 CMOS chip, which makes it, like the Wang PC, twice as fast as the IBM PC. The system comes with 512K bytes RAM standard, See NEWS page 5

# Wang Office | Sperry users talks to IBM doubt value of

Communication links to Disoss, Profs, 3270 forged

LOWELL, Mass. - Wang Laboratories Inc. last week announced several links to IBM's office communications systems in a move to convince current and prospective customers that it has the superior depart-mental environment for IBM mainframebased networks.

Among the communications links an-

nounced last week were the following:

• An upgrade of Wang's Office/Disoss
Gateway from Version 1.0, introducing
software Releases 1.5 and 2.0, both of which will include LU6.2 and Information See WANG page 5

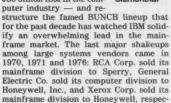
# **Burroughs** tie By Alan Alper NEW YORK — Sperry Corp. customers are demanding assurances that their in-

vestments in Sperry systems will be protected and enhanced in the years to come in the wake of Sperry's agreement last week to a takeover by Burroughs Corp. Sperry's action occurred following two

weeks of tense negotia-tions and after Burroughs agreed to a sweetened ac-

quisition offer totaling \$4.8 million in cash and se

The proposed acquisition would create a corporation with \$10 billion in revenue - second only to \$50 billion IBM in the com-



Sperry insiders contacted last week said there is a good deal of uncertainty within the organization concerning the merger's impact. "We've not gotten any word from management as to what's going on," said one middle manager, who requested anonymity. "No one knows where they nymity.

Sperry users, meanwhile, continued to lament their mainframe supplier's potential loss of independence, taking little comfort from Blumenthal's statements that

See SPERRY page 4

# AT&T divisions back together

By Elisabeth Horwitt

NEW YORK — AT&T last week announced major organizational changes that signal its intent to return to a predivestiture unity as quickly as Federal Communications Commission regulations al-low. The plans disclosed by AT&T Vice-Chairman Elect Randall Tobias would place AT&T Information Systems and Communications divisions under a single managerial structure, headed by Tobias.

The changes represent AT&T's first step toward coordinating sales, marketing and product development efforts for the two divisions. At the time of the AT&T divestiture, the FCC had originally mandat-

See AT&T page 6

### **CW EXCLUSIVE**

### Head crashes: MIS seeks aid for sensitive disk drive problems

IS managers and disk drive vendors have discovered that the thin-film head technology used in new disk storage systems requires much stricter computer room purity than earlier disk types.

Thin-film technology uses heads that fly 12 to 13 microinches above the disk, as opposed to the 20 to 25 microinches of its ferrite-head ancestor. Not only is there less space between head and disk, but the material thin-film heads are made of is not as durable as the older ferrite materials, says C. E. Shannon, director of Customer Engineering Head-quarters Operations at Memorex Corp., the storage products subsidiary of Burroughs Corp. "When a contaminant comes in contact with the new head, it won't bounce off like it did on ferrite. Instead, it crashes," Shannon says

"In November, we were get-ting ready to install some Burroughs thin-film disk packs, and Burroughs had some concerns about our environment," says about our environment,
Jim Donovan, chief of computer
operations at the University of
Medical Center. Although the university's computer room was adequate for the two Burroughs B7900 computers and various Burroughs disk drives that inhabited it, the vendor was concerned that the more sensitive thin-film drives would not perform well there, Donovan

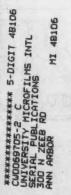
Burroughs had good reason to consider the air quality when it sold the new

systems to the university. While many computers and peripherals are hardy and are not affected by slightly insufficient environmental purity, thin-film disks are very sensitive.

"Our air conditioner sucked air right off the freeway and blew it into our environment," says Chris Scharff, manager of information systems at Yamaha

International Corp. in Buena Vista, Calif. The dirty air caused disk prob-

See MIS page 12



NEWSPAPER

# Fujitsu nets ISDN contract for Illinois Bell/McDonald's trial

### For headquarters, training center net

By Peggy Watt

McDonald's Corp. and Illinois Bell Telephone Co. last week announced that the first equipment contract for their planned Integrated Services Digital Network (ISDN) was awarded to the U.S. communications products subsidiary of Japanese mainframe vendor Fujitsu Ltd.

Fujitsu America, Inc. of San Jose, Calif., will provide digital telephones, voice and data termitals, workstations and network adapters for the trial run, which is scheduled to begin later this year [CW, May 5].

Patrick Krause, telecommunications director for McDonald's, told Computerworld that Fujitsu was selections and could provide satisfactory technology, the required level of expertise and appropriate support.

Fujitsu, according to Krause, will be one of several customer premises equipment suppliers for the trial test. Other contracts are being negotiated,

The parties involved refused to attach any dollar figure to the contract awarded last week and said only that Fujitsu would supply "a significant number" of the workstations to be used. More than 100 vendors were said to have inquired about various contracts for the project; about 20 submitted bids.

An Illinois Bell spokesman said the company is still negotiating to select an estimated five to 10 suppliers that will participate in the trial run, scheduled for December. He said the other contracts will be awarded fairly soon, in time for an organizational meeting of all participants in mid-

Under Illinois Bell's coordination, an ISDN of more than 400 lines will be built to serve the fast-food company at its corporate offices and training facility, Hamburger University, in Oak Brook, Ill.

The completed system will handle voice communications over internal, outside and long-distance network services, high-speed data transfer, image transmission, electronic mail and other information handling, all over the same lines from the same workstations. The trial run is expected to last 18 months to two years.

Krause said the initiation of the trial has been delayed because of AT&T's delay of software development for its Number 5 Electronic Switching System digital switch, which will provide the interface between McDonald's on-premises equipment and outside communications services. Testing will begin in November or December rather than in September or October, he said.

Fujitsu will supply multifunction digital telephone", intelligent voice and data terminals, intelligent work-stations and adapters for gateways, said Lou Sena, Fujitsu manager of product line planning. None of the products to be used in the McDonald's trial testing are yet on the comercial market, but Fujitsu installed similar prototype versions in ISDN trials in Japan and Singapore, he said.

"I think McDonald's has a very clear and focused idea of what ISDN can do," he said. "This is a complex architecture, but the possibilities for applications are tremendous."

Fujitsu will use such standard hardware interfaces as RS-232 computer connections, RJ-11C for telephony and V.35 for high-capacity data transfer such as facsimile transmission. Other connection guidelines will come from the switch supplier, AT&T, with a 5ESS. The trial will adhere to the CCITT interface.

However, Fujitsu will still do some new development for the McDonald's trial test, Sena said. "We're taking the current models and building on their foundation, basically adapting a couple fundamental designs in image processing and the user interface." he said.

However, he said, Fujitsu does not expect to have to develop any major hardware from scratch for the Illinois trial. "We are already developing a product line," he added. "I think one of the reasons we got selected is not just our equipment but the experience we bring."

### In this issue

### NEWS

Burroughs' acquisition of Sperry would be accomplished in two steps: first in cash, second in preferred stock and debt/4

Hewlett-Packard introduces Unixbased processor, first engineering-oriented offshoot of Spectrum/ **6** 

Rolm announces Redwood entry-level digital telephone system that can be configured as key system or digital PBX/8

Tandem and Arthur Young team up for computer-integrated manufacturing solutions/ 8

Indy 500 timing team uses trackside computers to figure results/ 10



Decision Data Computer Corp. expands into multiuser computer market, unveiling two systems that are software compatible with both IBM's System/36 and IBM's Personal Computer/ 10

Debate heats up over IBM's mid-range processor strategy; an announcement expected soon/ 13

Four former users of NCR systems sue the vendor for supplying allegedly defective minicomputer hardware and software/ 15

### COMMUNICATIONS

Applitek Corp. announces minicomputer-based Network Management System for Unilan line/ 19

Infotron INM net manager offers color graphics, multitasking windows/ 19

### SOFTWARE & SERVICES

Austec International's Distributed Access Product gets independent confirmation of performance claims/ 25

Digital Equipment offers a DBMS to manage information by geographical reference/ 25

### MICROCOMPUTERS

Laboratory Technologies' software plugs real-time data into Lotus Development's 1-2-3/31

Visual Communications Network, Inc.'s graphics software package operates stand-alone or with spreadsheets, supports IBM's Enhanced Graphics Adapter and includes data base of more than 2,000 images/ 31

### SYSTEMS & PERIPHERALS

A growing electronics company uses McDonnell Douglas Pick-based minicomputers to keep information systems abreast of changes/ 45 Inmos adds to its line of Transputer components for parallel processing systems/ 45

### **COMPUTER INDUSTRY**

Digital Communications Associates looks to acquire additional companies that specialize in data communications products, its president says/117

Sorbus is positioned to cash in on maintenance opportunities presented by its various sister companies within Bell Atlantic Enterprises/ 150

Lotus signs a letter of intent to acquire Graphic Communciations, Inc., developer of Freelance and Graphwriter graphics software/ 150

### PRODUCT SPOTLIGHT

Advances in networking, portability and integration ensure increasing dominance of PC word processors over dedicated systems. But wise buyers adhere to careful evaluation and selection criteria when choosing from among the growing number of full-featured, low-cost micro-based packages. By Shawn Bryan/ 53

### IN DEPTH

Software protection plan: Vendors and users alike have legitimate fears about the availability of critical source code. Source-code escrow agreements offer one means of protection for both parties. By Reginald Weller and Shelley Wall/ 69

Don't throw your systems life cycle out out, clean it up: Users can bring these methodologies out of retirement and restore them to useful work. By Mark Duncan/ 79

### **OPINION & ANALYSIS**

Schneiderman on the demand for experienced telecom managers/ 17

Rosenbaum on charging for ISDN/ 19
Sweet on differences between tool buyers and tool users/ 25

Bender on a radical framework for application design/ 31

Connolly on whether the mainframe market slump signals a transition in the DP field/ 45

Rifkin on the bandwagon effect in the computer industry/ 150

### DEPARTMENTS



World Digest/ 14 Editorial/ 16 New Products/ 85 Calendar/ 114

# AT&T System 75 enhanced

By Elisabeth Horwitt

ATLANTA — A series of enhancements to AT&T's System 75 and 85 digital private branch exchanges (PBX) is scheduled to be unveiled today at the International Communications Association 39th Annual Conference and Exhibition.

The products represent another step in AT&T's strategy to use its digital PBXs as the basis for future Integrated Services Digital Network applications and services, said Senior Vice-President of Sales Richard C. Holbrook.

Highlights of the announcement include the following:

 Automatic Call Distribution, offered only on the System 75 digital PBX, enables a supervisor to reconfigure call control, send calls to the least busy unit and reroute calls to other groups during peak periods. • The Inbound Call Director and

Outbound Call Director and Outbound Call Director, automate PBX-based functions such as call screening and call placement.

 A new family of Call Management Systems was designed to meet the call handling needs of telemarketers and other specialized users.

 Unified Messaging Manager and Unified Messaging Link integrate a wide range of AT&T voice and electronic mail products.

 Audio Information Exchange-Medium and Speak-To-Me enable users to create, send and retrieve voice and text through a Touch-Tone telephone, terminal or workstation.

ILLUSTRATIONS ON PAGES ONE AND 17 BY ALAN WITSCHONKE

Name the fastest VM dump restore, and the fastest VM sort program.

(SYBACK & SyncSort CMS. What took you so long?)
Call (201) 930-9700.

Meet our supersonic systems.





If you didn't choose SYBACK and SyncSort CMS as the fastest in their categories, do not go directly to jail. But read this very, very carefully.

SYBACK, our fast dump restore for VM systems, and SyncSort CMS, the only high-technology sort for VM/CMS, represent a great technological leap forward. No other programs of their type can provide all three of the following positive advantages:

(1) THE FASTEST VM PERFORMANCE: SYBACK and SyncSort CMS make data move like greased lightning. Compared to their "competitors," these programs can save a tremendous amount of computer resources:

- 50% in Elapsed Time;
- 45% in VTime;
- 55% in TTime;
- 75% in SIOs.

These savings are the result of our exclusive Fluid Buffering Technique (FBT) First developed in OS and DOS sorting, we've now extended the benefits of FBT to VM backups and sorts.

(2) THE BEST VM PRODUCTIVITY: SYBACK and SyncSort CMS have tremendous operational flexibility and user friendliness. They're rich in features designed to reduce human intervention in backup and sorting:

• SYBACK—Automatic backup based on CP directory • Stand-alone restore capability • Incremental backup facility • Catalog of backup operations • Multi-tasking and execution under CMS • Interactive command processing • Standard-label tape support • Callable by user programs • DASD to DASD conversion and copying. Much, much more.

• SyncSort CMS—Sorts CMS, SAM (OS or DOS), or VSAM files • Can be invoked from COBOL, PL/1 or BAL programs • Dynamically allocates disk space • Selects relevant records for sorting • Reformats records on output • Performs summaries of designated numeric fields • Produces reports with pagination, headings and dates • Can often produce simple reports in one day rather than, say, five. Much more, too.

(3) THE FINEST TECHNICAL SERVICE: Our Technical Service specialist are experts in their individual fields. You can count on fast, efficient, courteous service in both backup or sorting operations. More than 85% of all user requests for service are resolved within 24 hours.

CAVEAT EMPTOR: As with all performance software programs, the best way to find out what SYBACK and SyncSort CMS can do is to benchmark them yourself against your present programs.

That should help you make up your mind fast!

### **NEWS**

# Two-step buy for Sperry

By Alan Alper NEW YORK Burroughs Corp.'s proposed acquisition of Sperry Corp. for \$76.50 a share would be accomplished in two steps - the first in cash, the second in preferred stock and debt securities — according to documents filed with the Securities and Exchange Commission.

Burroughs has offered to purchase some 31 million Sperry shares at \$76.50 in cash, which would give the Detroit-based firm majority ownership. After the offer expires June 10, a subsidiary of Burroughs, called SP Acquiring Corp. will be merged with Sperry.

At that point, the remaining Sperry shares will be converted into Burroughs 94% subordinated debentures, due in 1996, and Burroughs Series A cumulative convertible preferred stock.

Although Sperry's financial advisor, First Boston Corp., considered Burroughs' previous offers of \$70 and \$75 a share inadequate from a financial point of view, the \$76.50 a share proposal was deemed "fair."

"If you look at the \$76.50 price, it's much closer to Sperry's price of \$80 a share than Burroughs initial price of \$70," noted Harvey Poppel, a partner at merger and acquisition specialist Broadview Associates.

aid the transition, Burroughs is attempting to enlist the

aid of Sperry's top management.

According to the SEC filing, Burroughs is offering five-year management contracts to 26 Sperry employees, including Joseph J. Campanella, corporate vice-president and president of the Aerospace and Marine Group; Edwin Decker, corporate vice-president and president of the Defense Products Group; Edwin Gilbert, senior vice-president, controller and management information systems; Kurt Merl, vice-president and president of the Systems Management Group; and James Aldrich, senior vice-president of corporate planning.

### Sperry users doubt at Ceco Corp.'s Metal Building Systems subsidiary. "From what I hear, value of tie

the new corporation would support both firms' current computer architectures as well as accelerate development of enhancements.

Most users interviewed by Computerworld maintained the view held since Burroughs' renewed entreaties began early last month: A merger between the rival mainframe suppliers would offer few advantages to users and in fact could further erode confidence in both companies.

"I still don't see any benefits for the users," noted Martin Litzky, president of national Sperry users group Use, Inc. "If this is being done to reduce costs by \$150 million, which is peanuts for a \$10 billion company, it doesn't make sense. There are other

ways to do that withmerging two compacompeting nies.

Burroughs cials said the proposed acquisition should be completed within the next two months.

The companies would operate somewhat autonomously under a yet-to-be chosen corporate with Burname, roughs Chairman W

Michael Blumenthal at the helm, Sperry Chairman Gerald Probst as vice-chairman and Sperry President Joseph Kroger as president of the Sperry unit.

Although Blumenthal emphasized last week that no attempt would be made to convert one set of customers to the other's products, some Sperry users questioned the long-term plau-sibility of that policy given the current incompatiblity of the two firms architectures

### Sperry users fear loss

In the event Blumenthal abandoned that approach, Sperry users fear that it would be the Sperry ar-chitecture that would be jettisoned.

"If they tried to force me into a Burroughs environment, I most likely wouldn't move to Burroughs but to noted Robert Gatlin, director of Management Information Services

lot of people are reconsidering whether it makes sense to be non-IBM anymore."

Eventually, however, industry observers contend that if Blumenthal is to make the merger work, the new company is going to have to develop some sort of framework to tie the two disparate architectures together.

'That has to be a strategic goal over the next five to seven years," noted Harvey Poppel, a partner of Broadview Associates, a consulting firm specializing in mergers and acquisitions

'They need to have some sort of unifying structure. That doesn't mean they have to combine the two lines into one, but building a bridge, like what Sperry did with RCA, so they could communicate back and forth," Poppel said.

Citing the accelerating pace of technological change, Use's Litzky said it would be hard to project what

the combined company's product line might look like in the months or years after the acquisition is completed.
"It's hard to say

what will happen in 30 days, not to mention what will happen in five years," he said. "If you told me 30 days ago Sperry would be acquired by Burroughs, I would not have believed it,

- Robert Gatlin

Ceco Corp.

77

'If they tried to

force me into a

Burroughs envi-

ronment, I most

likely wouldn't

move to Bur-

roughs but to

IBM.

and now it looks like it will happen." Sperry users are concerned be-cause, as of press time, they had not been contacted by the supplier to apprise them of the situation.

That, observers said, is most likely to change in the near term.

"I expect that certain customers are going to be receiving a letter signed by Blumenthal and Probst within the next couple of days," Litzky said.

Some users, such as a group in New England [CW, May 25], have tak-en it upon themselves to contact Burroughs in an effort to voice their concerns on the implications of the

proposed merger.
"I wrote Blumenthal the day after it was announced," noted John DiPalermo, director of the New York State Social Services Department's Office of Information Technology Management. "The thing I wanted to make sure of is that not only is the 1100 line supported but that the new company continues to sink R&D into follow-on products."

Most observers agree that initially Blumenthal will not make any moves that might disrupt either firm's oper-

Sometime later, however, expectations are that heavy staff reductions will be needed to reach the roughly \$150 million in cost reductions that Blumenthal envisions in the first year of the combined companies' operation.

Blumenthal has dismissed such rojections as "premature and totally inappropriate.

To take advantage of the so-called critical mass created by the merger, Blumenthal is likely to combine functions such as purchasing, R&D and administrative support. Analysts also expect him to close redundant

### COMPUTERWORLD

Editor in Chief Terry Catchpole Executive Editor Sharon Frederick

News Director Peter Bartolik

Senior Edito James Connoily, Syste Clinton Wilder, Indust beth Horwitt, Commun haries Babcock, Softwavid Ludium, Manager

Senior Writers
Donna Raimondi
Rosemary Hamilto
Eddy Goldberg
Douglas Barney
Stanley Gibson
David Bright

Features Director George Harrar Senior Editors Janet Fiderio Glenn Rifkin

Associate Editors Amy Sommerfeld Fiore Becky Batcha Barbara Wierzbicki Senior Writer ael L. Sullivan-Trainor

Managing Editor Donovan White Chief Copy Editor Charlotte Ziems Donalds istant Chief Copy Edi Patricia Heal Erickson

Copy Editors Julie Cook Julie Cook Penny Janzen Susan Miller Kelly Shea Steven M. Ulfelder David W. Bromley

Design Editor Graphics Assista Jeff Babineau

stant to the Editor in Chief Parth Domke Editorial Assistants Paincia Faherly Christie Sears Nancy Shannon Linda Gorgone Laura Fredrickson

**News Bureaus** Mid-Atlantic 201/967-1350

n Alper, Correspond Washington, D.C. 202/347-6718 Witch Betts, Correspon Southeast 404/394-0758

James A. Martin, Corre West Coast 415/328-8064

Jeffry Beeler, Chief Maura McEnaney, Correspondent Peggy Watt, Correspondent Susan Blakeney, Director Edward Warner, Editor

Main Editorial Office Box 9171, 375 Cochituate Road, Framingham, MA 01701-9171 617/879-0700

Box 917.1 St.75 Coothstuste Hoad, Framingham, MA 01701-9171 G17879-07000 Computerworks is a member of the CW Communications from the Communication of the CWG group certained information. The group publishes over 50 computer publications is more than 20 major countries. Nine million people read one or more of the group's publishes. Nine million people read one or more of the group's publishes. Nine million people read one or more of the group's publishes. Nine million people read one or more of the group's publishes. Nine million people read one or more of the group on-thouse to the Computerwork Members of the group in-clude. ARGENTINA'S Computerwork ARGENTINA'S COMPUTERS ARGENTINA'S COMPUT

Second-class postage paid at Framingham, Mass., and additional mailing offices Computerworld (ISSN-0010-4841) is published weekly, except: January (5 issues), February (5 issues), March (6 issues), April (5 issues), May (5 issues), July (5 issues), August (5 issues), September (6 issues), October (5 issues), November (5 issues), and a single com-bined issue for the last week in December and the first week in January by CW Communica-tions/inc., 375 Cochituate Road, Box 9171, Framigham, Mass. 01701-9171.

Copyright 1986 by CW Communications/Inc. All rights reserved.

Communications/Inc. All rights reserved.

Computerworld can be purchased on 35 mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. Computerworld is indexed: write

to Circulation Dept. for subscription information.

PhOTOCOPY RIGHTS: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Communications/Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus \$.50 per page is paid directly to Copyright Clearance Center, 21 Congress Street, Salem, Mass, 01970.

on to photocopy does not extend to contributed articles followed by this

Special requests for reprints and permissions only should be addressed to Nancy M. Shan-nor, CW Communications/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass, 01701-9171. Subscriptions call toll free (800) 544-3712 or (215) 768-0388 in Pennsylvania.

Subscriber rates: \$2.00 a copy; U.S. — \$44 a year; Canada, Central & So. America — \$110 a year; Europe — \$165 a year, all other countries — \$245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin.





ABP

POSTMASTER: Send Form 3579 (Change of Address) to *Computerworld*, Circulation Department, P.O. v 1016, Southeastern, PA 19398-9984.

### NEWS

# Wang Office talks to IBM

From page 1

Distribution Services (IDS) as the VS-to-IBM mainframe transport options Version 1.0 includes IDS only, which provides VS-to-VS communication over an IBM Systems Network Architecture (SNA) network. Version 2.0 includes a capacity to send Disoss documents that is not included in Version 1.5.

 Version 2.0 of the Wang/Profs Gateway, which will allow Wang Office users to exchange messages between Wang Office and Profs.

tween Wang Office and Profs.

• Version 2.0 of Wang Office, which includes improved document

scanning features.

 An IBM 3270 logon capability that will allow users of IBM 3270 terminals to log on to a Wang VS by way of an IBM mainframe.

The new products will be available in July, except the Disoss gateway Version 2.0, which will be available in the fourth quarter of this year.

#### Direct connection

Pointing to future developments, Wang said it will provide its VS computers with a direct connection to the IBM Token-Ring PC local-area network and will implement IBM's SNA Distribution Service on its Wang Office/Disoss Gateway.

Neil O'Brien, director of operations at Mony Financial Services in Syracuse, N.Y., said he is very interested in the Wang developments, particularly the LU6.2 implementation,

and the 3270 Logon.

O'Brien estimated his department's investment in Wang equipment at \$15 million, including what will be a total of 100 VS computers by the end of the summer. He said he is in the process of installing IDS and will likely add some of the announced products to his system.

"All the vendors have to be IBM compatible now in order to be in the running for requests for proposals. If you don't have Disoss, you're out of the contract," said Vincent Flanders, associate editor of Access 86, a magazine for Wang users.

### **TOP OF THE NEWS**

NEWS from page

with an option to grow to 1M byte. The laptop features one 10M-byte, 3½-in. hard disk with an option to add another 3½-in. disk or a 5¼-in. floppy drive.

Electronic Data Systems is apparently the site of beta testing of a new 80386-based network, which was announced recently by Corvus Systems, Inc. of San Jose, Calif. Corvus spokesmen refused to say publicly where the tests were occurring, but sources said Electronic Data Systems has been working with Corvus on the processor for some time.

IBM has added its 1M-bit memory chip to a second product, the 3880 disk storage cache controller, which is now shipping from the company's General Products Division plant in Tucson, Ariz. Last month, IBM began installing the chips.

Gerry Paul, Wang vice-president of communications software development, said the new products give Wang a lead over both IBM and Digital Equipment Corp. in connecting minicomputers to IBM mainframes.

"There's less headache than putting in IBM," he said. Paul said IBM has no Profs gateway on the System 36 and no support for the Disoss library interface. DEC sells Disoss connectivity products that include LU6.2 but does not offer a Profs interface.

"The real devil in Wang's eye is Digital," said George Colony, president of Forrester Research, Inc. in Cambridge, Mass., describing inroads that DEC's All-In-1 office automation product has made in Wang's share of the market.

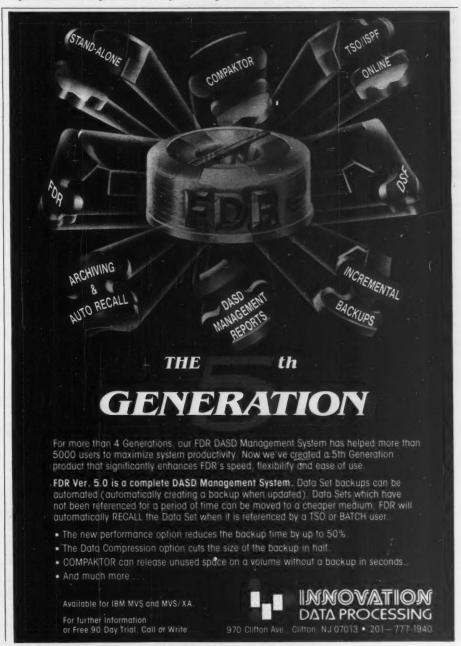
Colony added, however, that Wang's announcements gave him a positive impression of the overall health of the company. The Wang 3270 VS Logon allows IBM 3278 terminal users to access Wang VS applications through an IBM mainframe, such as Wang Office and Pace as well as such peripherals as disks and printers. However, Wang officials said it is not yet known how many terminals the system can handle, and Wang is currently testing to determine its limits.

Version 2.0 of the Disoss gateway, which will be available in December, will enable a Wang VS user to send a Disoss document. Currently, a user can file and retrieve documents from a Disoss file. In addition, Version 2.0 will allow a Wang Office user to add Disoss and Profs users to a Wang Office electronic mail directory as if they were Wang Office users.

Wang Office Version 2.0 improvements include a new document indexing and searching function that allows users to locate a document by author, title, date created and words in the text.

The Profs gateway consists of software on the VS, priced at \$2,000, and software on the IBM mainframe, priced at \$20,000; software for the 3270 VS Logon is priced at \$2,000. Pricing for the Wang Office/Disos Gateway depends on whether LU6.2 or IDS is used. LU6.2 and IDS software for the VS is priced at \$4,000; Document Content Architecture to Wang word processing translators on the VS are priced at \$2,000; LU6.2 software on the VS is priced at \$3,000.

Wang also announced new Wang Office license fees ranging from \$495 to \$18,000.



For the first time,

HP is addressing

both the manu-

facturing and en-

gineering arenas

through one

product line, the

HP Performance Technology Center

- Carl Morganstern

# HP's 1000, 9000 series converge at high ends

By Jeffry Beeler

PALO ALTO, Calif. — Uniting its two principal computer lines, Hew-lett-Packard Co. last week introduced a Unix-based processor that is the first engineering-oriented off-shoot of the company's Spectrum development project. The action represents the high-end convergence of the company's HP 1000 series manufacturing system and HP 9000 series engineering workstations.

HP spokesmen also contend that the 16- to 64-user processor, officially called the HP 9000 Series 800 Model 840, provides three times better price/performance than the Digital Equipment Corp. VAX 8600.

The 9000 series supports the same

AT&T Unix System V-based HP-UX operating system as the Model 840, allowing users to recompile existing code when migrating over. But the HP 1000 series operates the Real-Time Executive operating system, and porting applications will require an extensoftware conversion using a set of migration tools called Port/HP-UX.

The base configuration of the 840, with 8M bytes of main memory, expandable to 24M bytes of main memory, is priced at \$113,500, which includes the operating system and a C compiler. According to HP, the unit is scheduled to begin shipping at the end of this year.

The Model 840 employs the reduced instruction set computing (RISC) architecture that was announced in February with the long-awaited HP Series 3000 Models 930 and 950 superminicomputers.

The 840 drew qualified praise from analysts. It provides HP with "a compute-server and data-resource sharer that was previously the missing link in their technical systems product line," said Dave Burdick, director of computer-aided design and manufacturing industry services at Dataquest, Inc., a San Jose, Califibased market research firm.

But the company's comparison of the 840 to the VAX 8600 was downplayed by analysts. "There couldn't be a worse comparison," said Charles Foundyller, president of Daratech, Inc., a Cambridge, Mass.-based research firm. "The 8600 is not a RISC machine, so they shouldn't be compared on a million instructions per second basis. It's probably 2½ times faster than the IBM RT Personal Computer; that would be a fair comparison."

Both Foundyller and Burdick found the 840 presently lacks the breadth of software available for the

For the first time, HP is addressing both the manufacturing and engineering arenas simultaneously through one product line, the 840, according to Carl Morganstern, a technical staff member with the company's Performance Technology Center.

The resulting union of the 9000 and 1000 families allows factory automation and computer-aided design or engineering systems "to speak the same language and share data between the two environments." Morganstern said.

HP President John A. Young said the Model 840 verifies the price/performance benefits the company projected for its RISC-based HP Precision Architecture. The Model 840 also "reaffirms HP's commitment to employ this new architectural foundation across all our major computer systems for years to come," Young said.

By eliminating infrequently used instructions and adopting other design tricks that further enhance

throughput. High architec-Precision ture reportedly enables the 840 to equal the performance of a VAX 8600 one-third the price. HP's performance claims were based on benchmark tests in which a 24Mbyte 840, rated at 4.5 million instructions per second (MIPS), and a 32M-byte 8600 ran identical "comkernals' putation that involved no I/O,

according to an HP spokesman.

Like the latest additions to the 3000 family, the 840 supports HP's recently introduced Allbase data base management system, which is said to provide both relational and network interfaces to the same information.

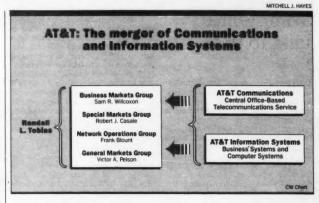
The 840 also supports Advanced Research Projects Agency and the University of California at Berkeley Unix Version 4.2 interconnection capabilities as well as the firm's existing Network Services and LAN/800 link products, which together allow the workstation to connect to other HP systems.

In a related development, HP last week offered five additional bundled versions of its HP 9000 Series 300 technical workstation family. Each of the packaged Model 320 systems is intended to compete directly with designated workstations from IBM, DEC, Sun Microsystems, Inc. and Apollo Computer, Inc., according to Ted Chen, HP's Series 300 and 500 product manager.

According to HP, the five additional Model 320 bundled systems range in price from \$13,000 to \$34,900, compared with \$44,950 for the Model 560

HP also announced the Model 560, formed by adding another two processors to its existing HP 9000 Series 500 Model 550 workstation and increasing its main memory. Unlike the 550, which incorporates just one CPU and starts with 2M bytes, the 560 uses three processors and holds up to 8M bytes, Chen said.

Senior writer Rosemary Hamilton contributed to this report.



### AT&T reunites two major units

From page 1

ed a division between AT&T's central office-based telecommunications services and its customer premise equipment and computer services, a mandate dropped in the FCC's recent Computer Inquiry III decision [CW, May 19].

"Now that the FCC no longer forces us to keep our networking and computer businesses apart, we can substantially improve our ability to focus our assets and abilities on specific vertical markets," Tobias said last week.

The major impact on AT&T customers will be AT&T's ability to integrate the offerings of the two divisions at both the sales and product level.

"Before, if you were a large business, you would get calls from two sets of AT&T salespeople who often were competing with each other," said AT&T spokesman Michael Tar-

By FCC regulation, sales representatives from the two divisions could not even talk to each other before making their presentations, he added. "Now, we'll have one team head, with up to a dozen support people specializing in data/voice networking, PCs or whatever."

Responding to questions about recent losses in AT&T Information Systems' computer division, Tobias said that the computer business will be "increasingly important to AT&T. A lot of people have interpreted our strategy as being in the computer business, period. Instead, we will be leveraging our communications and networking offerings in the computer business, focusing on the three things together."

AT&T is currently examining how to coordinate joint development of products that would mesh AT&T Commmunications' central-office-based services and AT&T Information Systems' customer premise private branch exchange and switching equipment, he added.

Despite Tobias' assurances, Joaquin Gonzalez, a senior analyst at Stamford, Conn., consulting company the Gartner Group, Inc. interprets the recent organizational reshuffling as meaning: "The AT&T Communications way of viewing the world has triumphed over AT&T Information Systems." Gonzalez predicted that "AT&T will be de-emphasizing its computers" and emphasizing "its ba-

sic strength, which is its telecommunications network," over customer premise equipment.

In order to conform to FCC regulations, AT&T must continue to maintain separate accounting for the two divisions, Tobias said. "We've failed to find any 'noncompetitive' market where the cross-subsidizing regulations don't apply," Tobias said. When asked if AT&T Information

When asked if AT&T Information Systems and AT&T Communications will ever truly be one company, Tobias replied, "Never say never."

AT&T "does not expect any major layoffs to result from the organizational merger," Tobias said. "There will be some efficiencies as a result of the merger; with 210,000 employees, you can expect a lot of attrition, ups and downs."

"What AT&T announced is not the total organizational change," said Greg Carlsted, senior industry analyst at San Jose, Calif.-based consulting company Dataquest, Inc. "You can expect more announcements in the fall." He added that AT&T's new organizational structure is "significant in that they are positioning themselves to utilize their resources more effectively than they have done in the past. Now that they are free of the Computer Inquiry II ruling, we'll see some major changes in the way AT&T looks at its customer premise products and networking services."

Under the new regime, 92,000 AT&T Information Systems employees and 118,000 AT&T Communications employees will be allocated among four groups, headed by presidents who will all report to Tobias (see chart). The four new organizations are the following:

• Business Markets Group, headed by Sam R.Willcoxon, oversees marketing and sales for all AT&T Communications products; AT&T Information Systems' large business systems including PBXs of 80 lines or more; and computer systems.

 General Markets Group, headed by Victor A. Pelson, oversees consumer products, sales and service, as well as general business systems (PBXs under 80 lines) from AT&T Information Systems; consumer markets and services from AT&T Communications.

 Special Markets Group, headed by Robert J. Casale, is responsible for managing selected joint ventures and partnerships with other companies.
 Network Operations Group,

 Network Operations Group, headed by Frank Blount, designs and manages AT&T's nationwide network. The organization's information management and movement resources will be available to the other three groups.

# WHEN THE BOSS'S KID STARTS REWRITING THE FINANCIALS,

# WHAT'S YOUR DEFENSE?



### VMCENTER:

# THE ONE INDISPENSABLE SURVIVAL TOOL FOR VM DATA CENTER MANAGERS.

Breaking into your online system isn't supposed to be child's play. But all too often, it is.

Unless, of course, you have VMCENTER.

VMCENTER is the one comprehensive system that addresses all your key concerns as manager of a VM data center. And none of those concerns is more important than the security of your system and data.

That's why VMCENTER provides multiple authorization levels—for maximum control over system usage.

It's also why we've designed VMCENTER to make it easy for you to customize your protection to meet specific needs. You can change passwords in a flash, encrypt data through simple commands, and use on-line reports to keep top management informed of potential security problems

before they happen—not after.
But if you think VMCENTER is great for security, you should see what it does for disk and tape management, resource scheduling, workload balancing, and system accounting. In one stroke, VMCENTER eliminates all your biggest headaches. And does it in an integrated manner that's more effective than any possible collection of quick fixes.

VMCENTER. It's not much fun for the boss's kid. But it can be a lifesaver for his dad—and for you.

For more information on VMCENTER, call or write VM Software, Inc., 2070 Chain Bridge Road, Suite 355, Vienna, Virginia 22180, telephone (703) 821-6866.



### Digital system bucks feature-rich trend

By Elisabeth Horwitt

Rolm Corp. today is set to announce Redwood, an entry-level digital telephone system that can be configured as either a key system or a digital private branch exchange (PBX). The announcement precedes an AT&T low-end digital PBX introduction by approximately a week, according to analysts.

The new product "spans all the needs of the small- to medium-size business," according to Rolm President Dennis D. Paboojian. While CBX, Rolm's existing digital PBX line, starts at 32 lines, an entry-level Redwood system starts at eight lines, noted Judith Ross, product market-ing manager for Rolm's Advanced Products Division. The system can be upgraded to up to 144 lines as a business grows, she added.

Redwood Model 1, a manual key system, is available now. Model 2, the key/digital PBX version, will ship in September. Customers can upgrade the Model 2 key system version to a digital PBX by changing the software, Ross said.

"Rolm has taken a risk, flying in the face of industry wisdom that says users want feature-rich digital PBXs." commented Greg Carlsted, senior industry analyst at San Jose,

Calif., consulting company Data-quest, Inc. Rolm is banking on demand for an easy-to-install offering somewhere between a key system and a PBX in terms of functionality and price, he added.
Standard Redwood features in-

clude call conferencing, call forward-ing and speed dialing. The PBX version also features least-cost routing.

'There was a demand for hybrid key-PBX systems, which was largely met by AT&T's Horizon and other vendors' hybrids," commented Michael Bobrowicz, a research analyst at Stamford, Conn., consulting firm, the Gartner Group, Inc. "We see current market growth as fairly flat."

The Redwood currently offers no direct link with Rolm's Phonemail, although users can forward or pick up calls on the voice messaging system, Ross said.

"The low-end market has small need for data," Ross said. "CBX serves our customers' data communications needs.'

Carlsted criticized Rolm for not offering data on its initial Redwood offering but gave Rolm points for Red-wood's support of Rolmlink, "a digital connection that is a step away from Integrated Services Digital Network and IBM connectivity.

Redwood pricing ranges from \$600 to \$800 per line, including telephone sets. The system's pricing per interface is 10% to 35% lower than that of the CBX, Ross said.

# Rolm to unveil low-end PBX | Tandem, Arthur Young joint CIM pact breaks new ground

By Rosemary Hamilton CUPERTINO, Calif. — In an unusual alliance, Tandem Computers, Inc. announced last week that it signed an agreement with Arthur Young, a Big Eight accounting and consulting firm, to jointly provide products and services to manufactur-

ing customers.
Although many vendors have forged partnerships to jointly develop manufacturing automation products, the Tandem alliance is apparently the first formal agreement between a computer vendor and a Big Eight consulting concern in the computer-integrated manufacturing (CIM) market.

Some observers question whether such an arrangement detracts from the consultant's role as objective advisor, but both Tandem and Arthur Young said the agreement is nonexclusive. Most of the Big Eight firms have informal working relationships with CIM vendors.

"We remain interested in other vendors because there are as many solutions to CIM as there are vendors," said Woodrow Chamberlain, a partner in Arthur Young's manufac-turing consulting group. "We don't go out and recommend anything. But we are expressing an opinion that says you should consider Tandem seriously when considering CIM."

According to the agreement, Tandem and Arthur Young will provide a hardware and services package to customers "embarking on a major new strategy in CIM," said Gerald Peterson, vice-president of marketing at Tandem. Arthur Young will work with customers in the areas of software, training, support and overall strategy. Tandem will provide its line of Nonstop fault-tolerant computers and associated networking products.

Some of the other Big Eight firms said they have chosen not to make agreements because formal have not found the appropriate partner or because they believe it would compromise objectivity.

Larry Roches, senior manager in the manufacturing consulting prac-tice of Peat, Marwick, Mitchell & Co., said a formal partnership with a vendor would be "outside of our inde-pendence and objectivity policy."

John Arnold, a manager in the manufacturing consulting practice of Coopers & Lybrand, said that so far his firm has opted to work as a "preferred consultant" with such as Hewlett-Packard Co. with vendors.

But at Arthur Andersen & Co., partner Roger Willis said the idea of a formal agreement has not been ruled out. "We've thought about it and haven't come up with a situation that seemed right," Willis said.



Convert your existing computer terminal into a portable. Thanks to Chess carrying cases, you can take your terminal with you wherever

Here's why. Every Chess case is constructed from tough 1/4-inch-thick ABS plastic, and fully lined with shock-absorbing

And they're custom-designed to And they re-custom-designed to fit most major brands of terminals, including DEC, Wyse, Televideo, Lear-Siegler, Ampex and Qume. PCs, including AT&T, Compaq, IBM and many of its compatibles, and

many table top printers.
For more information, call Kathleen at (303) 573-5135. Special discounts now available on some models.



### DB2IMPLEMENTATION GUIDE

SPECTRUM TECHNOLOGY GROUP, INC., has developed an extensive collection of DB2 STANDARDS AND GUIDELINES under contract to MOBIL OIL CORPORATION.

### The GUIDELINES:

- Represent DB2 knowledge and experience gained at different installations
- Assist in developing cost-effective DB2 applications
- Complement Spectrum's series of DB2 design courses
- Can be tailored to your organizational requirements

The GUIDELINES are currently available for DB2 Release 1. DB2 Release 2 will be available in the near future. The GUIDELINES address ten major areas:

- Database Design
- **Application Design**
- Security/Authorization
- Application Programming
   Education
- · QMF • DXT Utilities
  - Roles/Responsibilities

If your company is implementing or planning to implement DB2, the GUIDELINES will provide valuable technical insight to your development and technical support organizations. For futher informaise call or write: Mr. Carl J. Lofaro, Director—Regional Sales



1250 Route 28, P.O. Box 5365 North Branch, New Jersey 08876 (201) 725-4010 es: Greenbelt, Md and Orlando, Fl.

# We're the leading vendor in the latest applications software survey\*... but we had an unfair advantage!

We were able to build state-of-the-art applications using our own 4th generation application development tools and advanced database technology from IDMS/R.

# LEADING MAINFRAME SOFTWARE VENDORS AS IDENTIFIED BY SURVEY RESPONDENTS

User Bas	se - 1984	User Base	- 1985	Vendor for 1	986
	M	anufacturing Rea	source Plannin	g	
IBM Sperry Comserv	34.5 8.6 6.9	IBM Comserv Cullinet	35.6 9.6	Cultinet IBM	42.1 13.2

MSA Cincom

Cincom Martin Marietta

Arthur And Burroughs

Inventory Control								
IBM		38.4	IBM	25.6	Cullinet	21.4		
Comserv		6.8	American Software	13.4	Undecided	14.3		
Walker		6.8	Cullinet	9.8	American Software	11.9		
MSA		5.5	MSA	9.8	Cincom	9.5		
Sperry		5.5	Comserv	4.9	Arthur Anderson	7.1		

Bill of Material Processing							
IBM	43.6	IBM	35.8	Cullinet	45.2		
Comserv	9.1	Cullinet	10.4	Comserv	17.1		
Sperry	7.3	Comserv	9.0	MSA	9.5		
MSA	5.5	Martin Marietta	6.0	IBM	6.5		
Arthur Andersen	3.6	MSA	6.0	Undecided	6.5		

Master Production Scheduling								
IBM	34.0	IBM	25.5	Cullinet	37.5			
Comserv	11.4	Cullinet	8.5	Comserv	18.8			
MSA	6.4	MSA	8.5	IBM	9.4			
NCR ·	6.4	Comserv	6.4	MSA	8.3			
Software Intl.	4.3	Honeywell	6.4	Cincom	6.3			

Integrated Financial (A/P, A/R, G/L)								
IBM	18.0	MSA	31.0	Cullinet	21.4			
McCormack & Dodge	18.0	McCormack & Dodge	21.8	MSA	17.9			
MSA	12.0	IBM	10.3	McCormack & Dodge	14.3			
Software Inti.	10.0	American Mgmt. Systems	3.4	IBM	7.1			
Information Associates	6.0	Cullinet	3.4	Lawson Assoc.	3.6			

<sup>&</sup>quot;The Software News/1986 Survey reports — "Cullinet's standings in manufacturing and financial software this year are clearly the most striking among all the mainframe software vendors. Cullinet, the leading independent supplier of mainframe database management software, began offering applications packages just three years ago."

To attend a Cullinet Seminar and learn more about Cullinet's 4th Generation Applications, phone toll free 1-800-551-4555.

The Leader in Information Systems Software



© 1986 Cullinet Software, Inc., Westwood, MA 02090-2198

## Trackside system logs official | Decision Data enters two results of Indianapolis 500

By Eddy Goldberg INDIANAPOLIS This year's rain-delayed Indianapolis 500 was not the first time the racing event caused problems for the people running the computerized operation that logs each racer's laps, pit stops and official finishing times

In 1964, when Jerry Challis wrote the first program to automate the official results, he was asked a week before the race what would happen if the race was stopped before the fin-ish. Since the Indy 500 had never been stopped before, he had not planned on that eventuality.

But, sure enough, the race was halted on the first lap due to a serious accident. A car lost control exiting the fourth turn, hit the inside wall, bounced against the outside wall and exploded, Challis recalled. Another car T-boned it, and both drivers were burned," he said.

Challis had to rush back to the IBM 7094 used that year and modify the program to subtract the time the race was stopped. The program was more fully modified before the next year's race in case it happened again. A. J. Foyt won that year with a speed of 147.35 mph.

In 1968, Challis rewrote the pro-gram in assembler language for the IBM 360. That program, later converted to run under IBM's MVS operating system, is still used today. However, the results were recorded manually and entered into an off-site computer until 1978 when computers made their first appearance at the course itself.

The first trackside computer was called an Ascore, Challis said. Each of the 33 U.S. Auto Club timers pressed a stopwatch button attached to the Ascore every time their car

In 1981, a Dataspeed RT500 computer (the RT stands for race track) was brought in and used as a backup to the Ascore. That was the year Bobby Unser won after a court battle that took the title away from Mario Andretti.

Today, the Dataspeed RT500 is still used, backed up by an IBM Personal Computer XT. Two more XTs attached to the Dataspeed log the recorded data on a disk. The Dataspeed also has a feed to ABC, allowing the television network to broadcast the standings on a moment-to-moment

After the race, the information on the PCs is transferred off diskettes onto an IBM 3033 mainframe, where Challis's 20-year-old programs compute the official results. The computer time is donated by the Indianapolis firm, Pallm, Inc., where Challis works. Pallm supplies software to the insurance industry.

The whole timing operation employs about 100 to 125 people, Challis said, and no two years are alike. Two years ago, when Rick Mears won in a record 163.62 mph, the Dataspeed went down 67 laps into the race, was restored and then went down again. The race information, which is ultimately backed up by people writing lap information on clipboards, had to be entered into the mainframe after the race. "We had to reconstruct the whole race afterwards." Challis said.

This year, although the rain delay did not cause any computer problems, it did inconvenience the roughly 400,000 fans who showed up. When asked what he did on the rained-out weekend, Challis replied, "We got wet."

# systems in multiuser mart

'If we used the

technology used

in 1971 to design

the System/36, we'd be cheating

the customer.

— Larry Gerhard Decision Data Computer Corp.

### Desksides compatible third-party-developed applications with System/36

By Alan Alper NEW YORK — Decision Data Computer Corp., a supplier of IBM System/34, 36 and 38 peripherals, last week expanded into the multiuser computer market, unveiling two systems that are software compatible with the IBM System/36 as well as the IBM Personal Computer.

Although Decision36 is not plug

compatible with the System/36, it is source-code compatible with the IBM system, which the company said enables it, after recompiling, to run business and pro-fessional application software written in RPG-II under IBM's System Support Program. It is object-code compatible with Mi-

crosoft Corp.'s MS-DOS, so it can run application packages written for the IBM Personal Computer.

Larry Gerhard, Decision Data president, said the firm opted against plug-compatibility with the System/ 36 because it wanted to improve on IBM's decade-and-a-half-old design. 'If we used the technology used in 1971 to design the System/36, we'd be cheating the customer," Gerhard

Instead, he said, working with outside vendors, Decision Data designed a system using the Personal Computer AT bus architecture that could run

for the System/36 while providing distinct price and performances advantages

Decision36, initially available in a deskside or desktop configuration, is aimed at small to medium-size corporations, branches or divisions of corporations and, to a lesser extent, departments within large companies, noted Ed Marino, marketing director of Decision Development Corp., the Decison Data unit responsible for the marketing the system.

First-time users as well as current

System/36 are being targeted by the firm's direct sales force, distributors and value-added resellers. who will be marketing the system, he added. Current IBM resellers, in partic-ular, are being approached to market the system.

One value-added reseller has already been signed, Execu-

tive Technology Data Systems, which sells into the certified public accounting market.

The primary deskside configuration supports between eight and 16 users and includes 512K bytes of main memory, 512K bytes of user memory on Intel Corp. 8088-based boards, up to 800M bytes of hard disk storage and an optional ¼-in. streaming tape drive for backup.

### Supports ASCII, twinaxial devices

Both ASCII and twinaxial devices are supported. Prices range from \$14,000 to \$55,000 for a 16-user sys tem with 800M bytes of hard disk storage, Marino said.

An entry-level desktop configuration, supporting between two and eight users, offers the same features as the deskside unit, but it can only be used with ASCII devices, Marino said. Prices range from \$8,200 to \$25,000, he noted.

Production quantities of the Decision36 will be available in September although select value-added resellers will be able to receive shipments beginning next month.

Advertisement

# **SAS Institute Sets New Standards** for Mainframe C Compilers

SAS Institute Inc. announces a mainframe version of the Lattice® C compiler, allowing development of C programs on IBM 370 machines and easy interface with non-C programs and software packages.

"C has emerged as the language of choice for developing applications that are portable across operating environments," says Institute Marketing Vice President Ione Cockrell, who views the compiler as a tool for protecting a company's programming investment.

"Virtually every new computer supports C," she explains, "and portable programs created with the mainframe compiler under OS or CMS run on any other machine with a C compiler."

The compiler uses standard IBM linkage conventions, allowing assembler language programs, MAIN routines in other high-level languages, and packages such as IBM's ISPF and GDDM to be invoked directly from C.

"A C function can be called directly from a high-level language, or a MAIN function in a high-level language can be called directly from C," adds Institute Language Systems Manager Oliver Bradley. "Mainframe programmers can now use C in place of assembler for developing small, fast subroutines called from other languages

The extensive function library includes nearly all functions from Kernighan and Ritchie, the Lattice C compiler for personal computers, and the draft ANSI C standard. Information is provided on individual function portability.

Bradley says the Institute built ease of use into the compiler and library. "We've designed the listing and crossreference to make a program easy to follow and errors easy to find," he says. "The compiler and runtime library produce explicit numbered error messages, and a trace-back of active function calls is displayed when a C program is abnormally terminated by the operating

Other mainframe products available from the Institute include a Lattice C cross-compiler, which generates PC object code ready to download to a personal computer; and Phoenix Software Associates' Plink86™ for linking compiled programs and Plib86™ for structuring object file libraries on a mainframe.

The products are licensed on an annual basis, with technical support and enhancements provided free as part of the license agreement. Additional information is available from the Software Sales Department at SAS Institute Inc., Box 8000, Cary, NC 27511-8000 or by calling (919) 467-8000.

SAS is a registered trademark of SAS Institute Inc. Lattice is a registered trademark of Lattice, Inc. Plink86 and Pib86 are trademarks of Phoenix Software Associates Ltd. Copyright © 1986 by SAS Institute Inc. Printed in the USA.

800-343-6474

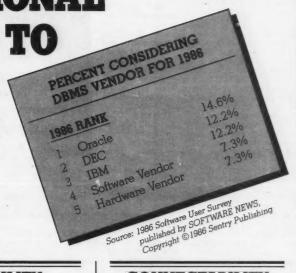
Hard as we try to give our readers the most complete information, some stories never reach us.

Are you involved in an unusual application of DP technology in your company? Have you implemented successful cost-cutting strategies? Is something in your DP shop not working as designed? Know any unsung heroes?

If so, we'd like to hear from you. Computerworld has established a reader hot line for information regarding items of interest to the computing community. Call us toll free at (800) 343-6474. Ask for the hot line editor.

Attend a free half-day seminar and find out why DBMS buyers rank Oracle number 1.

ORACLE RELATIONAL
DBMS ROCKETS TO
#1 IN THE 1986
SOFTWARE
USER SURVEY.
WHY?



### COMPATIBILITY

The ORACLE® relational database management system is compatible with IBM's SQL/DS and DB2. SQL/DS and DB2 represent IBM's latest generation of database management technology for IBM's largest computers. ORACLE's capabilities and user interface — the SQL language — are identical to those of SQL/DS and DB2. Programs written for SQL/DS and DB2 will run unmodified on ORACLE.

### PORTABILITY

SQL/DS and DB2 run only on IBM mainframes; ORACLE runs on IBM mainframes, DEC, DG, AT&T, HP, Stratus, Sperry, Prime, Honeywell and several other manufacturers' minicomputers, and on a wide range of microcomputers including the IBM PC/XT and PC/AT. ORACLE runs under vendor-proprietary operating systems or under UNIX."

All versions of ORACLE are identical and include a complete implementation of SQL— not a subset.

### CONNECTABILITY

Having the same software running on your mainframe, minis, and micros greatly simplifies the task of connecting your machines into a network. ORACLE's network software allows microcomputer users to directly access data stored in the shared database on the mainframe or minicomputer, or copy that data into the database on their micros and operate independently.

Today, minicomputer users polled in the Software User Survey rank Oracle Corporation as their number one vendor choice for 1986. ORACLE is the number one relational DBMS, with thousands of installations on IBM mainframes, DEC, DG, HP and most other vendors' minis and micros, including the IBM PC. In fact, INC. MAGAZINE ranks Oracle as the fastest-growing major software company in the USA. Surprised? Don't be. Oracle introduced the first relational DBMS and the first implementation of SOL back in 1979.

To attend the next free, half-day seminar in your area or receive additional information, write Oracle Corp., Dept. SWS, 20 Davis Drive, Belmont, CA 94002, or call 1-800-345-DBMS.

### **ORACLE Seminar Schedule**

	AK	Anchorage Jun	24
	AZ	Phoenix Jun 5, Aug	5
-	CA	Los Angeles Jun	10
		Jul 10, Aug	6
		Newport Beach Jul	15
		San Diego Jun 17, Aug	7
		San Francisco Jun 19. Aug	
		Sunnyvale Jun 10, Jul 8, Aug	
	CO	Denver Jun 17, Jul	
		Hartford Jul	16
		New Haven Aug	20
	FL	Jacksonville Aug	
		Tampa Aug	
	GA	Atlanta Jul	
	TA	Des Moines Jun 25, Aug	
	ID	Boise Jul	
	IL.		
	IN		
	IIA	Indianapolis Jun 17, Aug	19

OKWOPE 261	ш
Louisville Aug	7
New Orleans Jul	11
Boston Jun 19, Jul	16
	12
	12
	13
	9
	28
	Louisville Aug

TAT BATTARTA	
NY Syracuse Aug 19	
OH Akron Jul 23	
Cincinnati Aug 5	
Cleveland Jul 22	
Columbus Aug 12	
Dayton Jul 8	
OK Oklahoma City Jun 24	
Tulsa Aug 26	,
OR Portland Jul 24	į.
PA Harrisburg Jul 8	š
King of Prussia Jul 24	1
Philadelphia Jun 18	
Pittsburgh Jun 19, Aug 7	1
Scranton Aug 5	ò
RI Providence Jul 8	3
TX Austin Jul 10, Aug 19	7
Dallas Jun 11, Jul 22	
Ft.Worth Jul 15	5

TX	Houston Jun 10, Aug	19
	San Antonio Jul 8, Aug	27
UT	Salt Lake City Jun 5, Aug	6
VA	Norfolk Jun	4
	Richmond Jun	19
VT	Burlington Aug	6
WA	Seattle Jun 12, Jul	15
WI	Milwaukee Jul	17

### Canadian Seminars

Calgary Jun	3
Halifax Aug	20
Ottawa Jun 12, Jul 12, Aug	14
Chicoutimi Jun	18
Toronto Jun 3, Jul 8, Aug	5
Vancouver Jul	10
Winnipeg Jun 3, Aug	5

# ORACLE"

Call (800) 345-DBMS today.

Ottawa (613) 238-2381 Quebec (514) 337-0755 Toronto (416) 362-3275
ORACLE-UK. (SURREY) 441-948-6976 ORACLE-EUROPE (NAARDEN, THE NETHERLANDS) 31-2159-49344

© 1996 by Oracle Corporation. ORACLE® is a registered trademark of Oracle Corporation. SQL/DS, DB2 and IBM are registered trademarks of IBM.
DEC, DG, AT&T, Stratus, HP and Bell Laboratories own numerous registered trademarks. TRBA.

US CH NO

### **NEWS**

### MIS seeks aid for drives

From page 1

lems that led to downtime. The company was experiencing problems with its disks, tapes and CPUs, he says, but primarily with the Memorex thin-film head disks.

Considerations that did

Considerations that did not matter in the past have become vitally important. "Old specifications are not quite adequate if you are at the outside limits of the temperature and humidity ranges." Shannon says.

ranges," Shannon says.
The environmental factors in computer rooms that Shannon investigated were within guidelines, as far as Shannon's staff could determine. They did find that humidity and temperature levels varied from one part of the room to another, in some cases. To get a better fix on the problem sites, Shannon called in Winton Laboratories, Inc., a worldwide environmental management firm with offices in the Los Angeles area.

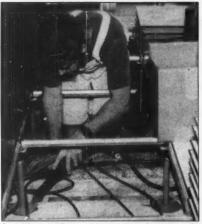
Winton Labs, a closely held company that derives \$9 million in revenue from computer-related engineering and consulting, specializes in finding the kinds of

computer room problems that can wreak havoc on thin-film disks. There should be an absence of carbon, rust and concrete dust. The temperature and humidity should be balanced. Those are the things to look out says Storm for. Larkins, president of Winton Labs. "Generally, if you are all right in those categories, you are not going to have pr lems," he adds. prob-

At a large communications carrier that requested anonymity, walls were knocked down during a project to expand

project to expand the computer room. During construction, dust settled under the floors and was sucked into the room through the air-conditioning system.

"In the last three- to fourmonth go-round before we discovered why we were having these problems, we had from seven to 10 head disk interferences a month," says the communications carrier's consultant of re-



Crumbling subfloors release dust into the air, wreaking havoc on thin-film disks. Winton Laboratories, Inc., an environmental management firm, decontaminates the subfloor surface.

gional hardware plans.

All three of the above managers solved their once-mysterious problems by calling in Winton Labs to search for the source of pollution and eliminate it. In Scharff's case, he heard about the firm and contacted it himself. At the telecom company, one of the three IBM plug-compatible manufacturers (PCM) represented in the computer room called in Winton; Bur-

roughs suggested to the University of Chicago that it call Winton. Memorex's Shannon says all of the companies he has found that perform the specialized work that Winton does are Winton subsidiaries.

In all cases, Winton Labs turned up the disk-crashing culprits, the managers say.

Yamaha's problems started in 1980, Scharff said. At that time, the company was unloading older IBM equipment and replacing it with a Burroughs B6800 computer

B6800 computer and some new disk drives. Within 2½ years, the firm had gone to a second B6800 and had added more drives. "We began to experience problems that caused downtime," he says.

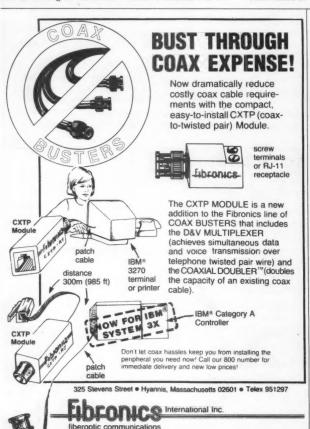
Winton discovered that Yamaha's 1970 air-conditioning system blew black hydrocarbon contaminants from the freeway right through the computer room. In fact, Larkins says, a map in Winton's offices that identifies problem locations is dotted with flags for a half-mile on either side of the Los Angeles freeway. Yamaha's site is alternately blown by the dry, dusty Santa Ana winds and soaked by night-time fogs.

Another culprit at Ya-

Another culprit at Yamaha was a crumbling concrete subfloor under the
floor tiles that released dust
into the room. Winton recommended replacing the airconditioning system to solve
the hydrocarbon problem
and installing different ceiling tiles to help solve the
humidity factor. The subflooring was coated with a
blue-paint-like encapsulant
that prevents further crumbling.

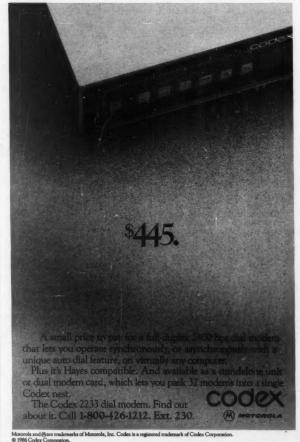
Scharff instituted other recommendations during a four-year period. "We are in the fourth year of improvements now, and it's all straightened out."

Scharff says he feels confident that his problems are gone, although he has contracted Winton to inspect the room quarterly and perform an annual cleanup. He has installed a Burroughs B7900 and new thin-film disks and has experienced no problems with either of them. "Our main production data base is on those thin-film disks, and they are hit with both reads



-800-DOUBLER

or (617) 778-0700



### NEWS

and writes several million times a day. They are doing fine," he says.

Yamaha did environmental monitoring on its own prior to calling in Winton, according to Scharff. They ran tests on the electricity to monitor drops and spikes and ran temperature and humidity graph units. "We saw the bad fluctuations but wondered where they came from," he says.

says.

The same was true for the other computer rooms. "I could tell if the floor was dirty, and I kept track of humidity and temperature, but it takes some sophistication to detect the tiny particles that can cause problems with thin-film disks," Donovan says.

The considerable cost of making a computer room pure is insignificant in view of the value obtained for the money, all of the users agree.

"The cost is reasonable compared to what the downtime costs," says the consultant for the communications carrier, a company that needs to maintain at least 99% reliability. "We have not seen a head disk interference that can be attributable to dirt in more than three months now. That seems like an eternity to us."

The communications company serves up to 20,000 end users in three large computer centers that include two IBM 3090 Model 200s, three IBM 3084 Model Q64s and five

3081 Model K32s attached to 900G bytes of direct-access storage devices (DASD). The principal types of DASDs are IBM and PCM versions of IBM's 3380 thin-film device. "We were seeing numerous head crashes on the 3380-type DASD, and we were looking for reasons," the consultant says. "We prefer not to say which vendors' equipment we had the most trouble with, but we had the least problems with IBM's."

In the process of knocking down walls, the company never noted that the air-conditioning was pulling up dust from under the floor into the computer room. "We never got under the raised floor to look," he says. Winton recommended cleaning and sealing the floors and in addition checked for temperature, humidity, clean air conditions and proper filtering systems. "We were lacking to

some degree in almost all of those areas. We changed our air-conditioning cycling so we do not pull in outside air without refiltering constantly. We sealed the floors, one of which was next to a loading dock, and we had our building maintenance people put in precautions to check humidity problems."

Donovan was impressed with the minuteness of the environmental inspections conducted at his site. "We installed three Burroughs 9630 laser printers, and Winton even inspected the best way to contain the carbon toner that these printers throw off," he says. "They suggested that we either create an I/O room outside the main computer room or that we relocate the printers inside the operations room but surround them by air grilles to keep the carbon toner directed away from the disk drives."



An encapsulant prevents further crumbling of the subfloor.

# Xerox makes these publishing tools obsolete.

# Shift seen for IBM CPUs

By James Connolly and Eric Bender

Speculation of a major shift in IBM's mid-range processor strategy grew last week with observers in the user, vendor and analyst communities predicting that IBM will soon announce some degree of unification of the System/36 and System/38 product lines.

The announcement could occur in mid- to late June, according to one user who asked not to be identified. He said that vendor sources in Europe told him that IBM plans to add RPG-III capabilities to a new version of the System/36 operating system SSP and that IBM plans a single replacement machine for the System/36 and System/38.

Speaking at a conference last week, consultants Amy Wohl and Dale Kutnick said they expect multifacted announcements from IBM.

Wohl, president of Wohl Associates in Bala-Cynwyd, Pa., reported that IBM officials recently spoke about "some kind of fusion of the 36 and 38 design."

Kutnick, executive vice-president of the Gartner Group, Inc. in Stamford, Conn., predicted that a small 4300, based on IBM's Micro370 processor running IBM VM Entry, could be announced by the end of 1986. However, he also said the System/36 and 38 could converge in four possible ways. The first way would be a large System/38 running SSP. The second means would be use of what he conceded would be expensive co-processors. The third way would be to bring SSP and the System/38's CPF operating system together. The fourth approach would be to develop common hardware for the systems.

Production Publisher Solutions



(PS 700 3700 Laser Publishing System Printing Sys



4050 Laser Printing System

XERONO and the identifying names and numbers listed herein are trademarks of XERON CORPORATION.

You can stop cutting and pasting. And stop sending in-house technical publications, catalogs, and reports to outside production houses.

Because now there's Production Publisher Solutions from Xerox, an array of hardware and software that enables you to produce documents faster and easier. With a quality that rivals outside print

shops.

For example, you can access powerful composition software to compose,
edit, and revise your documents electronically, so even last minute revisions
won't slow you down. And the Design
Pagination Terminal lets you design the
look of an entire document, and actually
merge text and graphics, including signatures, without using a sheet of paper.

The entire process is controlled by the Xerox Publishing System 700, one of the industry's most powerful integrated composition software. And it is made even more powerful through its use of the Interpress document and page description language. Not only will the XPS 700 manage all elements of the production process, it can be connected to a wide range of computers, printers, and other input and distribution systems you may already own.

The Xerox 4045 Laser CP, and the

The Xcrox 4045 Laser CP, and the 2700, 3700, 4050, 8700, or 9700 Laser

Printing Systems give you truly superior documents in more than 500 fonts. With job-programmable computers built right in, and almost countless capacity for workloads, they will send your current in-house publishing capabilities into obsolescence.

But the Xerox Production Publisher Solutions are much more than electronic break-throughs. They include the advice, service and support of the people of Team Xerox. In fact, Team Xerox will examine your office documents, and recommend precisely which office

machines will make your work easier. Call us at I-800TEAM-XRX, ext. 110. Our solutions just might be yours.

ntact me.
11

4

### NEWS



WORLD DIGEST Computerworld News Service

PARIS — The French government announced last month plans to ease its regulatory grip on telecommunications services.

In a move that was expected since elections put a conservative coalition into power last March, the government's proposed legislation would open up competition for value-added services and free the Postal Telephone and Telegraph (PTT) of its industrial policy-making role.

Gerard Longuet, the secretary of state for posts and telecommunications, said the legislation will be voted on by the French Parliament before mid-July.

Since 1837, the PTT authority has maintained a monopoly over all telecommunications-related activities in France.

MUNICH, West Germany
Aggressive foreign competition — and a passive government response — forced West Germany's fifth-largest computer maker, Periphere Computer Systeme GmbH, to sell 65% of its stock to the

maker, Periphere Computer Systeme GmbH, to sell 65% of its stock to the steel and engineering company Mannesmann AG, according to Periphere Computer founder and Chief Executive Eberhard Faerber in a recent interview.

The company was swept off the market by such U.S. computer firms as Apollo Computer, Inc. and Sun Microsystems, Inc., he said.

BERGEN, Norway — Microsoft Corp.'s Norwegian distributor for IBM Personal Computer software, Logos A/S, has discontinued its contract with the U.S. software firm.

"The reason is lack of support, delays in deliveries and an ignorant attitude from the vendor," said Bjornar Langeland, Logos A/S president.

Langeland also claimed that Microsoft does not appreciate the need to translate its software into Norwegian, a key to success for other software distributors in Norway.

LONDON — The UK is now the first country in Europe to offer phone users a choice of telephone networks. With the inauguration of the Mercury Communications system last month.

the monopoly of privatized British

Telecom has come to an end.

Although Mercury has been in competition with British Telecom since 1984, customers have so far only been able to lease lines from the fledgling carrier. But with the addition of three Northern Telecom, Inc. DMS-250 switches to its cable and microwave network, Mercury has launched itself into the voice switching business.

BRUSSELS — The clone wars between IBM and its price-cutting competitors took a new turn last month when London-based vendor Qubie Ltd. laid a formal complaint before the European Community Commission against the American computer giant.

Qubie is protesting that IBM's use of UK copyright and design protection laws to clamp down on clone vendors distorts competition in the European Community.

TOKYO -— Hitachi Ltd. has announced plans to boost its purchasing of South Korean electronic parts by up to 55% this year, to \$119.8 million.

These purchases will account for about half of all Hitachi procurements from Asian-based companies.

Because of the runaway appreciation of the Japanese yen against Korean currency, Japanese electronics vendors can now obtain Korean components for about 15% to 50% less than their Japanese equivalents.

Hitachi will buy largely from the three leading Korean electronics vendors — Goldstar Co., Samsung Electronics Co. and Daewoo Electronics Co.

wienna — Siemens Austria, a subsidiary of the West German computer and telecommunications giant, plans to merge its computer and data communications units.

Effective October 1, Siemens Data GmbH, the division selling terminals, personal computers and other OEM products, will be completely restructured, according to company officials.

The new unit is expected to employ about 1,000 people. Peter Amilinger, chairman of the board, said the firm is seeking to respond to customers' growing demand for systems that transmit and process voice, text, pictures and data.

TOKYO — Surveys may indicate that growth has leveled off in Japan's office automation market, but vendors at the annual Tokyo Business Show last month were out in force with networked and multitasking prod-

During the show, attendees had the opportunity to hear one Japanese executive urge vendors to "take radical steps to create a new office environment."

ucts expressly for the office environ-

ment

That executive, Takao Nagata, chairman of the show's sponsor, the Nippon Administrative Management Association, delivered the keynote address.

Nagata's view was echoed by Masahiro Akita, a computer salesman with Sanyo Electric Tokki Co, who said in an interview that "networking, multitasking and distributed processing are the three most important buzzwords in the market today."

ANDS-ON SEMINARS 1986

A Complete Curriculum for: End Users · Management · Applications Staff · Technical Support

COURSES	LONDON	BOSTON	CHICAGO	SAN FRANCISCO	LOS ANGELES	NEW YORK & SOMERSET	TORONTO 6 ORLANDO	WASHING- TON, D.C.	TUITION	EQUENCE TUITION †
UNIX Overview	Jan 14 Mar 11 Jun 3 Jul 29 Aug 23 Nov 18	Mar 18 Jul 8 Sep 16	Mar 11 Jul 22	Jan 28 Apr 29 Oct 21	Mar 11 Jul 22	Feb 4 Apr 15 Aug 26	Jan 28 Apr 29 Oct 21	Jan 14 Mar 11 May 20 Jul 22 Sep 30 Nov 18	\$225	\$860
GNIX Fundamentals for Non- Programmers*		Mar 19-21 Jul 9-11 Sep 17-19	Mar 12-14 Jul 23-25	Jan 29-31 Apr 30-May 2 Oct 22-24	Mar 12-14 Jul 23-25	Feb 5-7 Apr 16-18 Aug 27-29	Jan 29-31 Apr 30-May 2 Oct 22-24	Jan 15-17 Mar 12-14 May 21-23 Jul 23-25 Oct 1-3 Nov 19-21	\$735	
UNIX Fundamentals for Programmers*	Jan 15-17 Mar 12-14 Jun 4-6 Jul 30-Aug 1 Sep 24-26 Nov 19-21	Mar 31-Apr 2 Jul 14-16 Sep 22-24	Mar 17-19 Jul 28-30	Feb 3-5 May 5-7 Oct 27-29	Mar 17-19 Jul 28-30	Feb 10-12 Apr 21-23 Sep 8-10	Feb 3-5 May 5-7 Oct 27-29	Jan 20-22 Mar 17-19 Jun 2-4 Jul 28-30 Oct 6-8 Dec 1-3	\$735	\$1125
Shell as a Command Language®	Jan 20-21 Mar 17-18 Jun 9-10 Aug 4-5 Sep 29-30	Apr 3-4 Jul 17-18 Sep 25-26	Mar 20-21 Jul 31-Aug 1	Feb 6-7 May 8-9 Oct 30-31	Mar 20-21 Jul 31-Aug 1	Feb 13-14 Apr 24-25 Sep 11-12	Feb 6-7 May 8-9 Oct 30-31	Jan 23-24 Mar 20-21 Jun 5-6 Jul 31-Aug 1 Oct 9-10 Dec 4-5	\$490	,
*C* Language Programming *	Feb 24-28 May 12-16 Jul 14-18 Sep 8-12 Nov 3-7	Apr 7-11 Jul 21-25 Sep 29-Oct 3	Mar 31-Apr 4 Aug 4-8	Feb 10-14 May 12-16 Nov 3-7	Mar 31-Apr 4 Aug 4-8	Feb 17-21 Apr 28-May 2 Sep 15-19	Feb 10-14 Apr 12-16 Nov 3-7	Jan 27-31 Mar 31-Apr 4 Jun 9-13 Aug 4-8 Oct 13-17 Dec 8-12	\$1225	
Shell Programming*	Jan 22-23 Mar 19-20 Jun 11-12 Aug 6-7 Oct 1-2	Apr 14-15 Jul 28-29 Sep 6-7	Apr 7-8 Aug 11-12	Feb 17-18 May 19-20 Nov 10-11	Apr 7-8 Aug 11-12	Feb 24-25 May 5-6 Sep 22-23	Feb 17-18 May 19-20 Nov 10-11	Feb 3-4 Apr 7-8 Jun 16-17 Aug 11-12 Oct 20-21 Dec 15-16	\$490	\$1125
Using Advanced UNIX Commands*	Jan 29-31 Apr 9-11 Jun 18-20 Aug 13-15 Oct 8-10 Dec 3-5	Apr 16-18 Jul 30-Aug 1 Sep 8-10	Apr 9-11 Aug 13-15	Feb 19-21 May 21-23 Nov 12-14	Apr 9-11 Aug 13-15	Feb 26-28 May 7-9 Sep 24-26	Feb 19-21 May 21-23	Feb 5-7 Apr 9-11 Jun 18-20 Aug 13-15 Oct 22-24 Dec 17-19	\$735	,
GNIX Internals	Feb 17-20 Apr 28-May 1 Jul 7-10 Sep 1-4 Oct 27-30	Apr 21-24 Aug 4-7 Oct 13-16	Apr 14-17 Aug 18-21	Feb 24-27 Jun 2-5 Nov 17-20	Apr 14-17 Aug 18-21	Mar 3-6 May 12-15 Sep 29-Oct 2	Feb 24-27 Jun 2-5 Nov 17-20	Feb 10-13 Apr 14-17 Jun 23-26 Aug 18-21 Oct 27-30	\$1375	
ONIX Administration*	Feb 12-14 Apr 23-25 Jun 30-Jul 2 Aug 27-29 Oct 23-25 Dec 17-19	Apr 29-May 1 Aug 12-14 Oct 21-23	Apr 22-24 Aug 26-28	Mar 4-6 Jun 9-11 Dec 2-4	Apr 22-24 Aug 26-28	Mar 11-13 May 20-22 Oct 8-10	Mar 4-6 Jun 9-11 Dec 2-4	Feb 18-20 Apr 22-24 Jul 8-10 Aug 26-28 Nov 4-6	\$735	÷
Advanced 'C' Programming Workshop*	Mar 3-4 May 19-20 Jul 21-22 Sep 15-16 Nov 10-11	May 5-6 Aug 18-19 Oct 27-28	Apr 28-29 Sep 8-9	Mar 10-11 Jun 16-17 Dec 8-9	Apr 28-29 Sep 8-9	Mar 17-18 Jun 2-3 Oct 13-14	Mar 10-11 Jun 16-17 Dec 8-9	Feb 24-25 Apr 28-29 Jul 14-15 Sep 3-9 Nov 10-11	\$490	\$1125
Advanced 'C' Programming Under UNIX °	Mar 5-7 May 21-23 Jul 23-25 Sep 17-19 Nov 12-14	May 7-9 Aug 20-22 Oct 29-30	Apr 30-May 2 Sep 10-12	Jun 18-20 Dec 10-12	Apr 30-May 2 Sep 10-12	Mar 19-21 Jun 4-6 Oct 15-17	Mar 12-14 Jun 18-20 Dec 10-12	Feb 26-28 Apr 30-May 2 Jul 16-18 Sep 10-12 Nov 12-14	\$735	)
Berkeley Fundamentals and 'csh' Shell*	Feb 3-7 Apr 14-18 Jun 23-27 Aug 18-22 Oct 13-17	May 12-16 Aug 25-29 Nov 3-7	May 5-9 Sep 15-19	Jun 23-27 Dec 15-19	Feb 3-7 May 5-9 Sep 15-19	Mar 31-Apr 4 Jun 9-13 Dec 15-19	Jun 23-27 Dec 15-19	Mar 3-7 May 5-9 Sep 15-19	\$1225	200

Including hands-on training workshops "UNIX is a trademark of Bell Laboratories † Savings for consecutive seminar da

Call for details on:

- On-Site Seminars
- Video-Based Training
- Interactive Videodisc Training

Whether you are training 2000, 200, or two  $\dots$  you can select the most efficient and economical training solution for your unique environment.

To reserve your seminar space now, or for your free 48-page course catalog call (800) 323-UNIX or (312) 987-4084.

COMPUTER TECHNOLOGY GROUP

Telemedia, Inc. 310 S. Michigan Ave., Chicago, IL 60604 The Leading Independent UNIX System Training Company

### NEWS

# Former NCR users await legal action on systems claims

### Allege extensive bugs and inadequate service

Hoping to capitalize on the prece dent of the landmark Glovartorium. Inc. decision more than five years ago, four former users of NCR Corp. systems have legal action pending against the vendor for supplying allegedly defective minicomputer hardware and software.

Only one of the four unrelated cases involves a system still marketed by NCR. That system, a V-8555-II, is cited in a civil court case filed against NCR by Ryan-Walsh Stevedoring Co., a Mobile, Ala.-based cargo handling firm.

Other computers cited in the four cases are the 8200, 8230, 8250, 8400 and V-8455. All four plaintiffs claim their systems suffered from extensive bugs, resulting in so-called "si-lent death" crashes, data loss and crashes, data loss and significant down-time and that NCR was unable to adequately service the problems

In the precedent-setting Glovar-

All four plaintiffs claim their systems suffered from extensive bugs, data loss and significant downtime.

torium case, NCR paid \$2.6 million in damages to an Oakland, Calif., dry cleaning firm that won a lawsuit over its troubles with an NCR 8200 [CW, Nov. 1, 1982].

According to court documents, Ryan-Walsh is seeking \$1.5 million in compensatory damages and \$10 million in punitive damages resulting from alleged system failures of a V-8455 and later a V-8555-II it leased in the early 1980s.

Ryan-Walsh is charging that both NCR and one of its salesmen misrepresented both systems as reliable and working.

Ryan-Walsh is seeking a jury trial for the case, while NCR has argued that the issue should be resolved through arbitration. Ryan-Walsh and its attorneys declined comment on

Greeters of Hawaii, Inc., a tourist services firm in Honolulu, is seeking to recover \$100,000 in payments to NCR, \$450,000 in lost profits allegedly due to computer failure, "several million dollars" in lost potential reve-nue and unspecified punitive dam-

The revenue claim, according to a source close to the case, came from the firm's Aloha Reservations division, a subsidiary that set up an online reservation system on the firm's NCR 8230. Greeters of Hawaii claims it eventually had to sell the division after lost reservations and incorrect billing invoices, allegedly due to computer bugs, resulted in a significant loss of business

Greeters of Hawaii has officially charged NCR with breach of con-tract, breach of warranty, misrepre-

sentation and fraud. The plaintiff alleges that the Dayton, Ohio-based vendor "knew that the system had hardware and software deficiencies that resulted in lost data and shutdowns.

NCR attorney Pat Steiner could not be reached for comment on the

The Greeters of Hawaii case is scheduled for an arbitration hearing next month. Its leasing contract with NCR included an arbitration clause developed by NCR in the mid-1970s that specifies that any disputes over system problems must be resolved by an arbitrator rather than by a civil court judge or jury. Nitram, Inc., a Tampa, Fla., chemi-

cals manufacturer, originally filed its suit against NCR in district court in 1983, but the case has been stayed pending an arbitration hearing. Ni-tram alleges that its leased NCR V-8455 was plagued by disk crashes, slow response time and other problems

Nitram eventually converted its billing system to an IBM Personal Computer. The user was forced to run its production control system manually, according to sources familiar with the case.

Nitram ceased its lease payments after the system proved unusable, and faces counterlitigation in state court from NCR Credit Corp., the vendor's leasing unit. Nitram is seeking to recover the lease payments it did make plus unspecified damages from business problems allegedly re-

sulting from computer faults.
NCR attorney Robert Clark called Nitram's allegations "baseless" declined further comment.

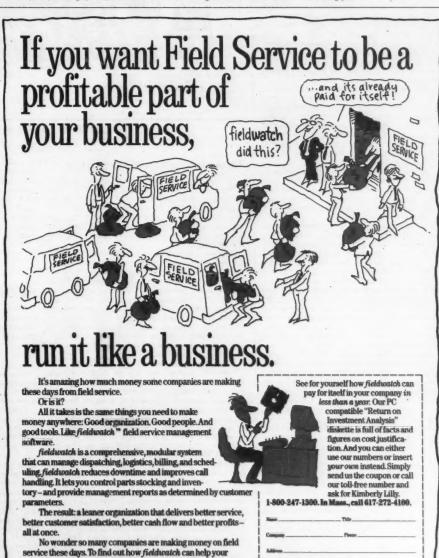
In another Florida case, Medical Billing Services of Orlando, Fla., is seeking more than \$1 million in damages due to its alleged problems with an NCR 8200 and an 8250 in the mid-1970s, according to the plaintiff's attorney, John Mahaffey. Medical Billing Services claims it had similar file corruption and system crash problems with both the 8200 it purchased in 1976 and the 8250 it bought the following year.

The DATA Group Corporation

Burlington Business Center To 77 South Bedford Street

C2

Burlington, MA 01803



organization, send for our free Return on Investment Analysis

watc

ette. We'll also send you full details on our new lease/

# VIEWPOINT

### **EDITORIAL**

# The yen for revenge

Computer and semiconductor industry people can be forgiven the urge to gloat a bit at the turmoil that the strong yen has created within Japan's business and political circles. U.S. products that used to be priced far above comparable Japanese goods due to the stronger dollar are suddenly cost competitive in Japan.

Partially as a consequence, Hitachi Ltd. and Fujitsu Ltd., Japan's largest computer manufacturers, reported a profit drop for 1985, and the Japanese electorate may deny Prime Minister Yakusuhiro Nakasone a third term due to his seeming inability to counteract the trend. Still, however savory the irony, temptations to gloat must be resisted as being both premature and ill-founded.

For one thing, the strengthened yen, on the rise since last September, has yet to have a discernible impact on U.S. computer sales abroad. Hitachi, Fujitsu and other leading Japanese computer manufacturers will squeeze their profit margins before letting the higher yen affect price. The Japanese have long held market share to be more important than profit levels.

portant than profit levels.

At the low end of the computer and peripherals markets, prices have not been dramatically affected, if at all, and here the Japanese are expected to expand manufacturing automation efforts to maintain a competitive

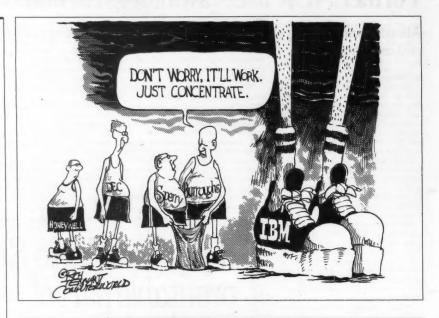
advantage.

Rather than gloating — or worse, advocating reactionary protectionist measures like the massive trade reform bill approved last month by the House of Representatives — U.S. computer makers should take advantage of this unique opportunity to push further into Japanese markets. Prices are down, and the Reagan administration is hinting strongly that it would help curb the yen's rise if Japan helped create even more domestic demand for imported goods. This combination of government inducement and lower prices affords U.S. manufacturers an excellent opportunity to expand their Japanese market.

The payoffs are already starting to come for U.S. companies who have pushed to expand their Japanese market. Cray Research, Inc., for example, recently sold two of its supercomputers to Japan's Nissan Motor Co., despite the latter's close ties to Hitachi, and Isuzu Motors Ltd. has made a commitment to Burroughs Corp. equipment. Nippon Telephone and Telegraph just signed its largest non-Japanese supply contract ever, with Northern Telecom, Inc.

True, the trade frictions between the U.S. and Japan have miles to go before they are put to sleep. As we have noted in this space before, there are fundamental differences between the two societies that still must be bridged. But protectionist measures can only damage the ties between the two leading information systems providers in the world, damage that would have a profound impact on corporate information systems managers around the world.

Now is plainly not the time for the U.S. computer and semiconductor communities to gloat over the Japanese economic predicament or to seek U.S. government trade intervention. Now is the time for them to show their development, manufacturing and marketing mettle, competing vigorously for Japanese sales and allowing the free market system to carry the day.



### LETTERS TO THE EDITOR

### Data sharing threatens privacy

In your editorial, "Computers aren't the issue" [CW, April 14], and in Daniel J. Lasser's letter, "Misapplying the principle of privacy" about the editorial [CW, May 5], you both imply that "the privacy advocates" don't know what they are talking about simply because they are critical of the way computer technology is threatening individual rights.

Lasser even tells us how we should be more credible and sincere. One way, he says, is to distinguish just which sort of computer matching is tolerable and which is not. We have done just that in congressional testimony in December 1982.

Receiving welfare, paying taxes, working for the government, registering for the draft, using food stamps — these are not criminal; they are activities we encourage, and people who end up on lists because they do these things ought not be subjected to computer matches simply because the technology is available.

The reasons for this are both legal and moral: Those who formed our Bill of Rights warned against general searches of everybody's house in the neighborhood, for instance. The federal Privacy Act prohibits data sharing of this sort. And the reasons are also practical: Data collected for one purpose — whether a middle initial, Social Security number or address — is not checked for accuracy when entered if it is not crucial to the transaction, yet it takes on life-and-death significance when it becomes the basis for a "hit" that can deprive one of public assistance, a livelihood, freedom from prosecution or simply the right to be let alone.

Lasser also implies that we "privacy advocates" should quit worrying about disclosure of IRS information because a notice on our tax returns warns us that some tax information will be shared. Does he realize that the American Civil Libertes Union and other privacy advocates struggled hard — against the Daniel J. Lassers of the 1970s — to impose that requirement of prior notice?

In the 1980s we are simply saying that federal agencies ought to comply with the nondisclosure requirements of the Privacy Act of 1974 and the Tax Reform Act of 1976.

Both Computerworld's editorial and Lasser's response repeat that old line that computers are not the problem. In fact, the massive data gathering of the 1980s could not possibly be conducted without automation. I worry less about personal informa-

tion about me in a dusty folder at the bottom of a file cabinet than I do about the same information recorded for posterity in an automated system, which permits long-distance and simultaneous retrieval, which eliminates the old deterrents of cost and space, which rarely distinguishes between contemporary and outdated information and which permits merging, linking, rearranging and analysis.

Robert Ellis Smith
Publisher, Privacy Journal
Washington, D.C.

### Personal data belongs to individuals

There are much deeper issues of law and morality underlying the recent editorial and letter about computer matching of files than those referred to by Daniel Lasser in "Misapplying the principle of privacy" [CW, May 5]. The one that is deeply embedded in Anglo-Saxon law is that everybody, even speeders and software pirates and welfare cheats, is presumed innocent until proved guilty. In continental Europe the Napoleonic Code led in a different direction, but in the U.S. the dragnet idea is not acceptable, in law or in good police practice.

Computer technology makes dragnetting cheaper and faster, and the current political atmosphere makes it otherwise tempting, but the Magna Carta and the Constitution will prevail.

It has been recognized in Britain and Sweden where oversight government agencies have been set up; it does not yet have the explicit support of federal law in the U.S. It is that personal data belongs to the individual, not to the organization that collects it, whether governmental or commercial, and can be used only for the purpose for which the individual gave prior consent.

Elements of this are found in official practice: IRS forms have a nonbinding reference, and on a homier level the Association for Computing Machinery controls its sale of mailing lists on that ba-

The abuse of credit agency information, driver and automobile registrations and even of such simple things as telephone cross-directories (which Ma Bell was always careful about) annoys every one of us. I hope that the file-matching discussion, and civil liberties concerns in general, will help eliminate those abuses.

Herbert R. J. Grosch Mies, Switzerland

# **VIEWPOINT**

# Help wanted: Seasoned telecom execs with management savvy

Technical, business skills a must for fast-paced job

ust a few years ago, market researchers were reporting that the demand, cost and growing variety of data communications systems were placing tremendous pressure on telecommunications managers to control costs and choose wisely among available options. It was an understatement then. Today, it's at best a gross oversimplification.

The technology is so fast moving. the issues so complex and the number of products and services so great that it is difficult for even the most experienced telecom specialists to keep

In fact, there are few people qualified to manage a corporate telecommunications system of any size. Yes, there are plenty of good voice-oriented "telecom managers" around. But very few qualified corporate-level people. And by all accounts very few. if any, voice people are able to make the transition.

### Few have implemented systems

"We have a situation where it's very difficult to find people who have been successful in implementing systems to recommend to a clisays Vincent S. Morgan, managassociate of Korn/Ferry

Schneiderman has been covering the computer and electronics industries as a reporter and editor for more than 20 years.

International, the largest executive search firm (headhunter) in the world. "As a result, we often see consultants on the case, and they're usually on top of other consultants.

This inability to find qualified people is forcing some large companies to take a backdoor approach. Ac-

cording to Morgan, companies are asking Korn/Ferry to survey other companies to determine how they are managing their total information resource, with a particularly hard look at telecommunications. With that information, these companies hope to better plan and integrate

their MIS, office automation and telecommunications systems - at which point they can be more specific with Korn/Ferry about what kind of people they need.

Will they be able to find the right people? Robert A. James, national di-rector of telecommunications for Arthur Young, a leading accounting and consulting firm, doesn't think so. He says the right people must be experienced and understand all of the technologies - voice, data, image, text, videoconferencing and graphics.

Equally important, he adds, they must understand their companies business. This last point is a big one backed up by experience and research. A survey by the Omni Group, a consulting firm, indicates that corporate information services managoften don't understand what business their companies are in.

Voice-oriented people won't make it as chief information officers or corporate telcommunications managers, says James, because they don't understand software. In addition, virtually every requirement in a telecommunications environment is unique and not amenable to a stan-

dardized turnkey solution. Systems are composed of a wide variety of transmission media and network technologies as well as a mix of terminals and other communications equipment and services

Telecommunications already ranks as the second-largest expense at many large corpora-

tions, after salaries. Some knowledgeable projections call for data costs in large companies to pass voice costs within the next three to five years. One more heady fact: There are about 75 DP people for every 1,000 employees in large companies compared with one telecommunications specialist for every 1,000. "That has to change," says James.

Where are all of these managers going to come from? The breakup of AT&T all but did away with the biggest source of trained telecom people, forcing many companies to grow their own.

Undoubtedly, many of the new telecom managers will come out of the MIS area. At least they have a head start: they may be middle managers with computer science or engineering backgrounds who know a little about their company's business. A few companies have developed training programs, picking managers with a demonstrated knowledge of the business and its marketing strategy and some technical background.

#### Training for telecom hard to find

There are schools, although very few, that offer specialized curricula Universities of Hawaii and North Carolina and New York University have telecommunications programs. Other schools allow their computer science and electrical engineering majors to load up on telecommunications courses, just as a business administration major might concentrate on marketing.

Last year, the State University of New York formed a multimillion-dollar Telecommunications Institute, a cooperative venture by the state and the Nynex Business Information Systems Co. One reason the program was started, according to a college official, was that "the industry tells us there is a need for 100,000 people with training nationwide, and very few colleges offer this program.

New demands for strategic applications, higher productivity computer-integrated manufacturing and design activities will put increasing pressure on corporate and MIS management.

Recognition of the importance of the telecom activity will grow with the realization that rising telecommunications costs will more than offset lower hardware costs, even if rates drop. The question may not be - as it often is - what's the cost, or even who's in charge, but does he know what he's doing?



# SDI demands trillions of instructions, 99.999999% reliability

READER'S PLATFORM

By DAVID BENDEL HERTZ

### Success depends upon near-perfect accuracy in untested situations

t has been said that the Strategic Defense Initiative (SDI or Star Wars) provides the U.S. with a rare opportunity to enhance national security and provide a basis for the next generation of industrial technology in one fell swoop. The military, academic and political communities are divided into two camps: "It will work" and "It won't work." But the real question is. How can we find out whether it will work if and when we

The general idea of Star Wars is that a large number of American satellites will keep watch over the earth's surface and instantly spot the takeoffs of enemy missiles, which, of course, must be distinguished from other similar but harmless activities on the earth's surface such as oil field burn offs. Then the satellites will communicate with supercomputers on earth to track and destroy the detected missiles with defensive weapons such as X-ray laser beams or antimissile missiles. The entire process of sighting, identifying and destroying must take place in a few

It has been estimated that the number of coordinate instructions for the computers will number in the trillions and that there will be hun-

dreds of thousands of performance-critical functions, some of which must be executed with a

reliability of 99.9999999 or better.

To indicate the magnitude of this task, an AT&T report last year stated that there were an average of 300 "serious errors" in every 1,000 lines of computer code at some 200 major corporate installations. It is well known that no large-scale program works right the first time: It is very likely that some parts of the SDI pro grams will be using combinations of various instruction sets for the first time because some combination of circumstances involved in an attack situation will give rise to unexpected input data

Some help in increasing reliability

and getting around these problems may come from artificial intelligence programs that are intended to build error-free programs for complex systems using high-level languages and self-validation and verification.

But if there are errors in such selfverified programs, they will be much more difficult to detect in advance or to find later. Past experience in developing and implementing complex, large-scale-computer-executed real-

time systems, in which extremely fast reaction in face changing and unanticipated in-

puts is required, does not provide much comfort

There may be bugs hidden in the underlying models that the codes are intended to implement. It is very difficult, almost impossible, to validate models of situations and events that have never occurred, except in a genuine confrontation - and that may turn out to be a bit late. And even if the models are correct, it is always possible that some parts of the code might cause the computers and their backups to crash

### sm most serious factor

The realism of the models is per-

haps the most serious factor in assessing risks that the program won't The models must make some simplifying assumptions about the real world, perhaps distorting it sufficiently so that what had worked in testing the model doesn't when applied to an actual situation. But this cannot be known for sure in advance. How do we test for what may have

been overlooked, omitted, misjudged? Could reliance on Star Wars as a "peace shield" lead to a worldwide Challenger disaster? How can we know until we try it? Are the technological risks, to say nothing of the political and economic considerations, worth it?

Open debate over these questions is essential to prevent the nation from being locked into a defense posture it will ultimately regret.

Computerworld welcomes opinion pieces from its readers. Submissions "Reader's Platform" column should be typed, double-spaced and no longer than six pages. CW reserves the right to edit them for the purposes of clarity and brevity. Submissions should be addressed to Editor, Computerworld, Box 9171, 375 Co-chituate Road, Framingham, Mass. 01701-9171.

Hertz is Distinguished Professor and Director of the Intelligent Computer Systems Research Institute at the University of Miami in Florida.



The Austec Conformable Environment™ lets networks of disparate computers running disparate operating systems distribute processing power, data, and applications on an ad hoc basis.

Thousands of existing commercial Cobol applications, including those originally written in DG Cobol, can move, execute freely and access data anywhere in the network. Regardless of the physical location of the program and data files.

Independent confirmation of this remarkable advance in computer



technology is provided by International Data Corporation. For a free copy of their report on Conformability, call 1-800-556-1234 ext. 508. In California 1-800-441-2345 ext. 508.

ACEBRIDGE, ACECOBOL, and the other products that make up the Austec Conformable Environment are only available from your computer manufacturer. They've been licensed by IBM, AT&T, Digital Equipment Corporation, NCR, Honeywell, Olivetti and other major vendors.

If your computer company doesn't conform, maybe DEMAND CONFORMITY

you should ask them why not. COMPUTER COMPANY.

Austec Inc., 2099 Gateway Place, Suite 400, San Jose, CA 95110, USA Austec Limited, First Floor Heathcoat House, 20 Savile Row, London W1X 1AE, England Austec International Limited, Ground Floor, 344 St. Kilda Road, Melbourne, Victoria 3004, Australia

The Austec Conformable Environment, ACEBRIDGE and ACECOBOL are trademarks of Austec, Inc.

# **COMMUNICATIONS**



WIRE TAP Daniel J. Rosenbaum

# Look twice at ISDN rates

ost data communications managers worth their salaries are thinking about how an Integrated Digital Services Network (ISDN) is going to change their jobs. The really smart ones are wondering how they're going to pay for it.

There are three basic benefits to an ISDN: easier access to mid- and high-speed data transmission; simplified, call-by-call access to a full range of voice and data communications services; and access to network control information that previously had been the sole province of the telephone com-

An ISDN network includes at least two kinds of lines. The first is a 64K bit/sec. circuit-switched line designed to carry user-provided data. That 64K bit/sec. line is called the B ("bearer") channel. The second line is the D ("data") channel, carrying packet-switched access and call set-up information for a cluster of B channels. The D channel will operate at either 16K bit/sec. or 64K bit/sec. — depending on how many B channels are in the cluster.

ISDN allows you to pick your service on a session-by-session basis and lets you use and monitor setup data. If you have a sudden but infrequent need for a bandwidth-monopolizing service such as videoconferencing, ISDN will, in theory, allow you to literally dial it up.

The idea behind ISDN — and it remains to be seen if this will be the reality — is that users will have to pay only for what they use. That sounds

See LOOK page 23

Rosenbaum is the editor of "Wiretap," an information industry newsletter published in Morristown, N.J.

# Hospital's needs set goals for Applitek net manager

By Elisabeth Horwitt

WAKEFIELD, Mass. — Applitek Corp. announced last week the commercial availability of Network Management System (NMS), minicomputer-based software that performs monitoring and diagnostics, accounting and security functions for the company's Unilan local-area network product line. Many of NMS's features were developed to meet the networking needs of the University of Michigan Hospital, an Applitek customer.

Applitek had already developed a basic diagnostic system that runs on Applitek's network interfaces, which link computers to the Unilan broadband networks. But the centralized management, accounting and security features were implemented at the hospital's request and according to its specifications, said Applitek spokesman Gerald McDonald. "The system would have been very different without the hospital's input," he said. "They helped us define the needs of large, multiuser sites."

The NMS collects statistics from each

Unilan network interface and displays information on a color monitor. Traffic and error-frequency statistics are monitored and logged on disks for later analysis. Records are maintained of interface updates, such as changes in the number of terminals or transmission rates. The NMS also monitors and compiles data on user transmissions and sessions for security and accounting purposes.

The new management features were a prerequisite for Applitek's landing the contract for the Ann Arbor, Mich., hospital's major network installation, according to Robert Dieterle, manager of the hospital's pathology data systems. "We could never have run a network this size without some kind of network management system," he commented.

The hospital plans to use the network to support approximately 1,030 asynchronous terminals that will be used by students, clinicians, technicians and administrators to access Digital Equipment Corp.

See HOSPITAL'S page 22

### NEW THIS WEEK

- Grid Systems offers a Distributed Secure Network for laptop microcomputers
- For more on this and other new products, see pp. 85-113.

### INSTANT

"The International Standards Organization's recommendations for defining field formats in financial transactions is another one of those standards where you give up a little efficiency in order to be able to add and change things more quickly and easily."
— Scott Loftesness,

Scott Loftesness,
 Visanet vice-president
 of access planning
 and implementation,
 Visa U.S.A., Inc.

# System unites net management

By Stanley Gibson

CHERRY HILL, N.J. — A centralized network management system recently introduced by Infotron Systems Corp. is a "significant improvement over the often patched-together networks currently in use in many customers' locations," a company spokesman said.

The Integrated Network Manager (INM) consists of Infotron's proprietary software and an Apollo Computer, Inc. workstation that features color graphics and multitasking windows. The system was designed to offer control of networks that include Infotron's 990NP network processors and its Infostream 1500 T1 multiplexers.

"INM offers customers gains in network availability and boosts network manager productivity, since a single operator can invoke network testing and diagnostics remotely instead of having to dispatch peo-

ple to the site," said Infotron spokesman Robert Bower.

Previously, each network processor had its own network diagnostic system. The new system, however, allows an operator to monitor and diagnose the status of all the network processors and lines from one terminal, Bower noted.

The INM will save users money both by speeding up troubleshooting and by reducing-downtime because of malfunctioning lines, he added.

The INM lets users concurrently monitor the network in one window, perform diagnostic testing in another and alter operating parameters in yet another window, according to Infotron. As many as 13 windows can be viewed at once, and information in the windows is updated in real time.

See SYSTEM page 23

# Token-ring patent holder Soderblom squares off with 3Com

# Polaroid precedent may be factor in suit

By Stanley Gibson

MOUNTAIN VIEW, Calif. — The Olof Soderblom patent controversy is rearing its head again as 3Com Corp. confronts the issue of paying the token-ring patent holder a fee for the use of the networking system.

"Soderblom is creating a significant problem for us and everyone else," said Robert Metcalf, chairman and senior vice-president of 3Com.

"We're arguing with Olof now," he added, indicating that the Swedish network designer has paid a personal visit to Metcalfe's Mountain View, Calif.-based company in order to discuss the question.

After developing and patenting a token-passing network system in Sweden in the 1960s, Soderblom filed for a patent in the U.S. that was granted Oct. 6, 1981, and is good for 17 years.

### Founded company to sell patent rights

Following the granting of the Swedish patent, Soderblom assigned the rights on it to the bank for whom he developed the system. Later, the bank assigned the rights back to him, and he founded a company called Willemijn Holding Co. in Rotterdam, the Netherlands, to sell his patent rights. Soderblom has retained the Washington, D.C., law firm of Pollock, Vande Sande & Priddy to defend his patent rights in the U.S.

IBM reportedly paid Soderblom \$5 million in 1980 for the nonexclusive rights to his token-passing configuration, and Ungermann-Bass, Inc. recently said that it would pay Soderblom for a license to market the system.

However, companies such as Natick, Mass.-based Proteon, Inc. have not agreed to pay Soderblom. Proteon has been selling a token-ring network for several years, insisting that its system does not infringe on Soderblom's patent.

### Polaroid decision may set precedent

Metcalfe said the recent instant photography patent decision rendered in favor of Polaroid Corp. has made many network professionals nervous. The decision in that suit, in which Polaroid claimed that Eastman Kodak Co. copied its instant photography process, resulted in Kodak's having to abandon its line of instant photography products, which it had been selling for 10 years.

### Some fear wasting net investments

Metcalfe said some networking professionals fear that a future court decision on Soderblom's token-ring patent might result in the waste of huge net investments, even to the point of having to tear cabling out of the walls of buildings.

Metcalfe explained that Soderblom is asking for a royalty of 1% to 3% of 3Com's systems' selling prices.

The royalty would include a per-See PATENT page 22

# Achieve Full Integration For Your Corporate PC... With The SAS System Under PC DOS.

One Integrated Solution For All Your Company Needs.

Now, you can have an information system that offers solutions for all of your company's needs. Data management and retrieval. Statistical analyses. Report writing. Applications development. And more. All in one product.

And you can use it in every department and for every application. Data entry. Business reports. Text processing. Statistical summaries. With the PC SAS System, decision-making, record-keeping, and analysis are standard and simple.

One Solution With Complete And Powerful Features.

The same high-quality software for mainframes and minicomputers is now available for PCs. And it offers features as nich as any mainframe system you've seen. A data manager. A full-screen text editor.



dBASE II and dBASE III are trademarks of Ashton-Tate, Lotus and 1-2-3 are trademarks of Lotus Development Corporation.

A windowing facility. Complete data manipulation and statistical procedures. A display manager (to edit, display and control output from your PC). An interactive programming facility. A front-end menuing system that you can customize! With the PC SAS System, you get the power of the mainframe and minicomputer SAS System. And more.

### One Solution For Your Micro-To-Mainframe Link.

Now, you can link your PC to your mainframe. With the same system at both ends of the link. You can download data to your PC. Or develop and test applications on your PC. The PC SAS system reads data from programs like dBASE II, dBASE III and LOTUS 1-2-3. You can enter data on your PC, submit your job to the mainframe, execute it, and view the results on your PC. Or you can download data from the mainframe, add and

revise, and send the new data to the mainframe for job execution or storage. Regardless of which system you use, the language, syntax and commands are identical.

### One Solution That Is Remarkably Friendly.

Now, one system offers special features like programmable "pop-up" windows that make "friendly" a term you can understand. Use these windows to program function keys. To create "help" messages. To check the variables in your data set. And these windows can handle practically any utility you need. In fact, the PC SAS System is so friendly anyone in your organization can use it.

### One Solution With Site Licensing And Full Support.

At last, you can have the information system for your PC you've always wanted. With the advantages of site licensing. You license the PC SAS System on an annual basis. You get all updates automatically. And at no additional cost.

The PC SAS System is also fully supported. Documentation accompanies delivery. Technical support is provided by phone or mail. Full customer training is offered. And it's all available from SAS Institute.

The Solution For SAS Power On Your Corporate PC. Now.

M

SAS Institute Inc. Box 8000, SAS Circle Cary, North Carolina 27511-8000 Telephone: (919) 467-8000, ext. 280 Telex: 802505 SAS RAL



SAS is the registered trademark of SAS Institute Inc. Copyright - 1985 by SAS Institute Inc. Printed in the U.S.

### COMMUNICATIONS

# Hospital's needs set Applitek goals

From page 19

VAXs and PDP/11s as well as Control Data Corp. Cybers and turnkey laboratory systems.

The hospital needed a centralized management system that would collect network performance statistics from about 43 Applitek NI10/T network interfaces distributed over approximately five miles of corridors, McDonald said. Also required was a way to store port configurations so that they could be downloaded to the network interfaces in case of update or network failure.

The hospital has stringent security requirements, Dieterle said. "Some 7

'Some of our patient and accounting records reside on computers with no internal security. And we have graduate students working part-time in our laboratories who often get the urge to hack.'

- Robert Dieterie University of Michigan Hospital

of our patient and accounting records reside on computers with no internal security. And we have graduate students working part-time in our laboratories, who often get the urge to hack," he noted.

#### **Multilevel** security

It was the hospital's idea to install multilevel security, McDonald said. On the network interface level, each port is assigned a "mask" containing up to 95 names, each of which provides the user with access to a different network resource. Still under development is a password security system that would enable users to petition the NMS for permission to access a particular network resource.

This second level of security is important for organizations such as the hospital, which have terminal pools

shared by a changing group of people, McDonald noted. "Fort-based security is probably sufficient when managers are assigned terminals on a fairly permanent basis," he added. Users can also access resources through the NMS when they are temporarily using a different port, Dieterle noted. "Users should be able to access the same resources from anywhere on the system."

Report generation is another NMS feature still under development, McDonald said. The existing system can be programmed to poll each network interface in turn at regular intervals and compile statistics on how many times a device had to retransmit within a given time period, "so you can diagnose trouble before it becomes serious," he explained.

#### Matwork recourse use

The NMS also keeps track of the use of network resources for accounting and billing purposes. But Applitek currently offers no package that analyzes network statistics and generates reports on overall network traffic patterns, error frequency and resource usage, McDonald noted.

Instead, customers can create their own customized reports using the DEC Record Management Service or other RSX-11 or VMS-based report generators. Applitek has indicated to the hospital that it will be offering a reporting package by the end of this year, Dieterle said.

Current gaps in the NMS product "don't inhibit us now but could be annoying in the future," Dieterle commented. "We are thinking of implementing the network campuswide, but not until Applitek's hardware, software and network management

software and network management is all in place."

Applitek announced the NMS a week after a similar introduction by Infotron Systems Corp., a wide-area network equipment vendor currently working out the details of a friendly acquisition of Applitek. "It was a complete coincidence," McDonald said. He added that a priority of the merger will be integrating the two companies' network management systems.

The NMS runs on a multitasking DEC PDP 11/73 or Microvax II, under RSX-11 or VMS. Available now, its pricing starts at \$20,000.

# Patent holder squares off

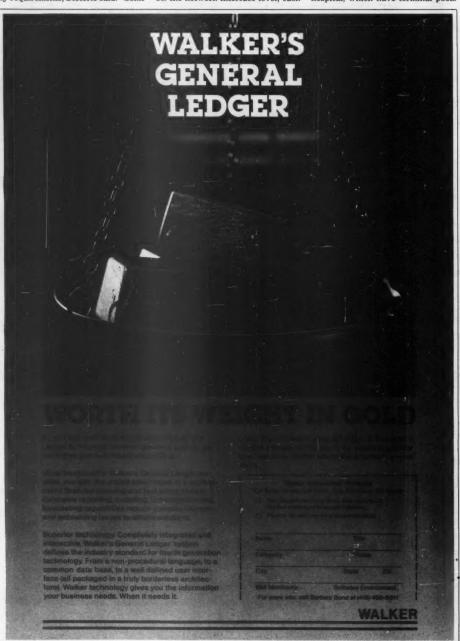
From page 19

centage of the value of the devices attached to the system, including mainframes.

Texas Instruments, Inc., which sells 3Com the chip sets used in its system, said it believes it is not liable to pay any patent license fees, but that systems sellers would have to pay any fees necessary.

Metcalfe pointed out that although the Institute of Electrical and Electronics Engineers, Inc. (IEEE) had held off making Ethernet a standard until it had settled patent questions with Xerox Corp., IEEE made IBM's Token-Ring specifications an industry standard even though Soderblom's patent claim was still pending.

Metcalfe is known as the father of Ethernet, which he developed while employed by Xerox.



### COMMUNICATIONS

### Look twice at ISDN rates

From page 19

great, but take a closer look at what it is you're using.

Some of the tariff structures used for today's networks probably still work with ISDN, but there are some wrinkles that alert data communications managers should think about today, even though they may not get the chance to use ISDN for the next five years or so.

Pre-ISDN switched networks insulate users from the setup and service selection processes. Service selection was always built into network access; you could not make a voice call over a line conditioned for data, for instance

Also, the cost of call setup was built into the price of a phone call. That's why the first minute of a call is more expensive than subsequent minutes - it costs more to provide that first minute.

Besides the data you send during a communications session (which in ISDN would be on the B channel), you are exchanging setup and call status information with both the net-

System unites net control

From page 19

The manager can view the entire network on the display screen, depicted as a color-coded map, with deteriorating lines drawn in yellow and line failures in red.

warning system that includes an audible alarm can be programmed by the network manager to alert him to deteriorating network conditions. For example, he can be informed when the frequency of errors rises above a predesignated threshold. A log records the date and time of all network alarms.

The system also offers a statistical summary of traffic utilization, average and peak loading. These reports can be stored on disk, archived on tape and reviewed later on the workstation.

ANM not made obsolete

The introduction of the INM does not make obsolete Infotron's other network product, the Advanced Net-work Manager (ANM), the company

Based on an IBM Personal Computer XT or AT, the ANM is sufficient for small networks that include either Infotron's 990NP network processors or the Infostream 1500, according to Infotron.

However, when the number of T1 lines in a 990NP network increases or the net's size increases to more than 32 990NP nodes, INM is needed, Bow er said. The INM can handle up to 64 990NP nodes and 14 T1 lines.

An INM designed to manage a network based on either Infotron's Infostream 1500 or the 990 Network Processor costs \$80,000; an INM designed to manage a network that uses solution to the state of the st

work and the called station (on what would be an ISDN D channel). B cause of the flexible nature of ISDN, you are likely to have to pay for everything you transmit, no matter which channel it moved on, just as you now pay for every second a session is active.

There is some justice to this, since D-channel information can be spectacularly valuable — perhaps even more valuable than the session it

If you have full access to your network's control information, you will be able to get an exact measurement of who is using the network for what at which hours

You'll be able to precisely charge back on a department, project or station basis. Call-accounting costs will drop dramatically, as will the manhours required to create the appropriate call-accounting data bas

What's more, because setup infor-mation includes the originating phone number, you will be able to tell who is calling you before you answer your phone. For that matter, you'll be able to program your phone to reject calls from certain numbers or sets of numbers. Self-configured WATS is more than a vague possibili-

All of this has a significant downside, though. Setup information is transmitted even if the call isn't com pleted. If you pay for everything transmitted in ISDN, you will be paying for no-answers and busy signals

as well as completed calls. No one will tell you that. When you ask AT&T about how ISDN will break down costs, they say they're

still thinking about pricing issues just before they tell you that setup takes so few bits that any charge would be "negligible." On a station-by-station basis, that may be true. But how many calls are placed every day in your network, and how many of those are uncompleted?

On the other hand, the information ISDN gives about uncompleted calls can tell you useful things, such as whether your network resources are deployed where they are really

The bad news, then, is that ISDN may well mean you'll have to pay for uncompleted calls. The good news is you may find strategic uses for the data those calls generate.

ISDN is, at minimum, five years off. If you're smart, you'll be thinking about ways to take advantage of it before it takes advantage of you.

# What's Good for Your Maintrame is Essential tor Your PCs

ow, you can take care of PC backup and security needs as effectively as for your mainframe.

PC Underware® from USS includes backup and security software products for IBM PC, XT, AT, and 100% compatibles. PC Underware provides integrated solutions for your most pressing PC

And, with a USS Unlimited Use License Plan, you can solve those problems for all your PCs for a low,

Let us show you our PC Underware. Call TOLL-FREE today for a free 30-day evaluation of any of

these fine PC Underware products:

- TakeTwo<sup>®</sup>—automatic hard disk backup.
- OnGuard hard disk access
- control security.

   PrivacyPlus®—data-encryption for hard or floppy disks and LANs, with optional security control and administration.

Providing backup and security for your PCs isn't just a good idea . . . it's a necessity. Call now.

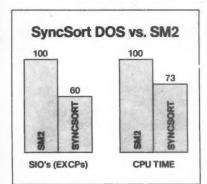
800-892-0007. In VA call (703) 556-0007.

# SMART COOKIE

Like you, SyncSort DOS is cut from a special mold.

Call (201) 930-9700.

It's healthy for your system.





One thing about smart cookies, they can spot each other a mile away.

While they don't flaunt their derring-do, they quietly know they're the best at what they do. Because substance shows through. Every time.

Especially when the going gets tough. And rough. As it often does in a DOS environment.

For example, a smart cookie doesn't crumble under the pressure of too many programs and too few programmers.

A smart cookie doesn't waste dough — but picks and chooses the right ingredient to keep production on the rise.

And sometimes, even, a smart cookie has to be a mighty tough cookie. That means being on the job constantly. Keeping things running and humming. Without draining vital resources.

All of which brings us to our smart cookie: SyncSort DOS. A cut above the rest if you ever saw one. Check these delicious advantages.

### BETTER PERFORMANCE

Pop one into your system and you'll see a mouthwatering difference. Immediately. SyncSort DOS will give you performance improvements like those shown in the chart on the left.

And performance features such as:

 Automatic Secondary Allocation — With this feature your sorts will never run out of disk space, i.e., no "sort capacity exceeded" messages.

### BETTER FEATURES TO IMPROVE PROGRAMMER PRODUCTIVITY

As you begin to digest SyncSort DOS, you'll find it more and more to your liking. With ingredients that cut down to size the amount of programming time going into applications.

- SortWriter A powerful tool that can produce extensive reports as a by-product of your normal sorting without user exits and the associated programmer investment. Headers, trailers, total and sub-total capabilities provide flexible formatting.
- Record Formatting Powerful features like INCLUDE/OMIT, INREC/OUTREC, SUM and others — with capabilities like data conversion, editing, insertion of literals.
- Multiple Output From a single sorted file, you can create
  multiple files and reports. Each can include the same or different
  data as determined by INCLUDE, OMIT, OUTFIL or OUTREC
  parameters.

### BETTER CUSTOMER SERVICE

Still another sweet advantage of SyncSort DOS: help is always there when you need it. 85% of all requests for service are resolved within 24 hours. We always rise to the occasion.

The moral to this story: smart cookies are quick to reject half-baked solutions in favor of SyncSort DOS. Call us for a demonstration. Once you get a taste you will be hungry for more.

### SyncSort DOS

One smart cookie deserves another.



## The high cost of sales hype

o you remember the commercial that brought the Ronco company into the annals of American folklore? It sold a device comprising a slanted plastic platform with a slightly raised horizontal blade at the lower end. It was called a "Veg-O-Matic." It had no moving parts. You worked it by pressing a vegetable onto the platform and sliding it over the blade. "It slices! It dices!," the man on TV smiled as he deftly reduced a raw potato to a heap of thin slivers

After ordering one and finding myself unable to duplicate the performance, I studied the ad more closely Only then did I notice that the friendly demonstrator had forearms like a blacksmith. He was awe inspiring. In a brawl, the fellow could have pounded me into the ground like a tent peg.

Tool salesmen stress their products' features and downplay the training they take to operate. They must, of course. They want to encourage sales. not frighten people away. And more often than not, no harm is done. One does not normally shop for a tool unless one has some training or experience in working it. Craftsmen seldom confuse artist and instrument. No musician asks the violin salesman if his product will play a great sonata. Writers do not ask if a typewriter will compose a novel.

There is one field, though, in which tool buyers and tool users are different populations, with often catastrophic consequences — data processing. This is probably because our profession is too new for our talents to have percolated into public lore.

Whatever the reason, hardware and software are often selected by those See HIGH page 28

Sweet is a free-lance data base consultant in Jacksonville, Fla. He publishes "Boxes and Arrows," a monthly newsletter for Cullinet Software, Inc. IDMS users.

# Cobol utility passes first test

### Networking extension 'lived up to its promise'

PALO ALTO, Calif. - An enhanced version of a systems utility that reportedly allows Cobol object code to be ported among dissimilar network nodes has received the first independent confirmation of its developer's performance claims.

In tests that International Data Corp. (IDC) conducted recently at its Technology Laboratories in Palo Alto, Austec Interna tional Ltd.'s just-announced Distributed Data Access (DDA) product "lived up to its promise," according to an IDC report.

The report's conclusion marks a turnabout from the market research firm's initial skepticism toward DDA and its reputed capabilities, which seemed "too good to be true," the five-page document said.

IDC is thus far the only known organization outside of Austec itself to have test-ed the DDA product under conditions that approximate a realistic work environment. The product was announced last month in

Austec, a 9-year-old Australian supplier of Cobol compilers and application generators, describes DDA as a networking extension to its existing Acebridge utility, which reportedly enables heterogeneous systems to operate together as one virtual machine.

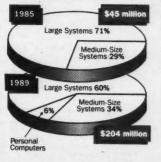
Since Acebridge's introduction in 1984. Austec has signed license agreements that make the product available with a raft of processors running Unix, Microsoft Corp. MS-DOS and IBM MVS. A few examples of CPUs that already support the utility include IBM's IX/370-based mainframes, NCR Corp.'s Tower, AT&T's 3B line and Digital Equipment Corp.'s VAXs. To date, Austec has been unsuccessful

in its efforts to negotiate a licensing arrangement with IBM that would give users access to Acebridge in the MVS and VM

Both Acebridge and Austec's Ace Cobol, a compiler that is reportedly compatible at the source-code level with most other Cobol compilers, are prerequisites for using

See COBOL page 27

# DATA VIEW **Data dictionaries:** Growing, independent marketplace



ided by International Data Corp.

612-933-2885 Telex 297 893 (BIM UR)

# **DEC** system targets utilities

MARLBORO, Mass. - Electric and gas utilities and petroleum exploration firms are among the target customers for a data base management system introduced by

Digital Equipment Corp.
The \$9,090 DBMS, Spatial/II, is designed to manage information by geographical reference using the DEC VAX line of computers. It will be available in

Spatial/II is intended to permit definition of data by points, chains, polygons, triangles and variable grids. These data structures allow a description of locally defined data in a three-dimensional context, according to Linda Moore, manager of DEC's Marlboro, Mass.-based Earth Resource Engineering Group (EREG).

DEC spokesman Ed Canty said the VAX

line is frequently used in oil exploration and that the need for a DBMS to handle geographic information "has been evident since the group was formed" three years

See DEC page 29

### **NEW THIS**

- Hewlett-Packard offers an Ada compiler
- Honeywell ports its CP-6 operating system to its DPS 90 information processing system
- For more on these and other new products, see pp. 85-113.

### INSTANT ANALYSIS

"The cable between the 3B2 and the 6300 system was unplugged to verify that the program was really executing locally."
— IDC Technology

Laboratories report on the new Austec Distributed Data Access product



**BIMCMPRS** 

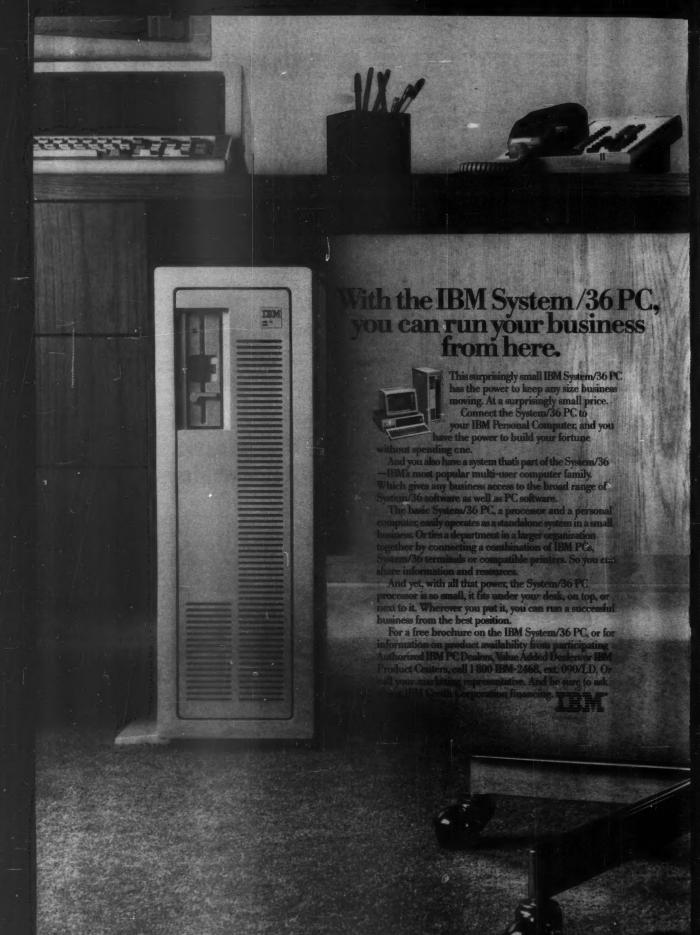
BIMCMPRS reduces 3270 CRT and printer output data transmission from CICS systems. This improves response time and reduces contention among terminals on the same line. Transmission reduction typically varies between 10 and 60 percent. Response time improvement depends on the reduction amount and the line speed.

A CICS transaction is included to display compression effectiveness statistics.

Call for full documentation or free 30 days trial.

Price: OS - \$2000 or \$100/mo., DOS - \$1600 or \$80/mo.

8M has 15 system software products for improving productivity and use of DOS/VSE, OS, and CICS, and also performs systems are programming currentlying. Marketing agents in most countries.



### **Cobol utility** passes first test

To take advantage of DDA's purported capabilities, a user first must provide each node in its target network with Acebridge, which typically sits atop a processor's operating system. The user also must run its existing Cobol applications through Ace Cobol to ensure that all systems in the network are compatible with each other at the object-code level.

Once all the software preparations are complete, DDA permits application code to be shipped from any Ace-bridge-supported processor to any other system, regardless of make, in the same network, according to Austec President Leslie McNeill.

For users, such portability of Co-bol application code yields a number of benefits, McNeill claims. Included

is the ability to do the following:

Balance processing burdens by downloading applications from an overtaxed central system like a VAX-11/780 running Unix to an IBM PC-DOS-based IBM Personal Computer AT, many of which are often under-

• Write an application on one network node, and execute it on another.

 Allow systems to obtain needed applications by using software that already resides on dissimilar nodes rather than by forcing users to devel-

op redundant programs from scratch. To check McNeill's product claims, IDC devised a series of tests in which DDA was required to perform several everyday operations on an Austecsupplied mailing list application.

In the first test, the application's source code was customized through

CA-JARS/CICS Release 5.0 gets CICS 1.7 support

By Eddy Goldberg GARDEN CITY, N.Y. — Computer Associates International, Inc. recently enhanced Release 5.0 of its CA-JARS/CICS product to provide sup-port for Version 1, Release 7 of IBM's enhanced Release 5.0 of its CA-CICS teleprocessing monitor running under MVS. The CA-JARS products provide an automated means of measuring software productivity and system performance

CA-JARS/CICS Release 5.0 came out in January and contains major functionality and feature improvements over the prior release that supported CICS Release 1.61. The recent enhancement to CA-JARS/CICS sup-ports CICS 1.7, which was introduced

by IBM last August.

The number of extensions that IBM made in CICS 1.7 required significant extensions to the monitoring product, explained David Tory, senior vice-president at Computer As-

sociates International.
CA-JARS/CICS is available for both the MVS and DOS/VSE environ-

The perpetual license price is \$19,000 for the MVS version. The DOS/VSE version currently supports CICS 1.61 and is priced at \$11,500.

Since Acebridge's introduction in 1984, Austec International Ltd. has signed license agreements that make the product available with a raft of processors running Unix, Microsoft Corp. MS-DOS and IBM MVS.

modifications. After compiling and executing it on an AT&T 3B2/400 running Unix System V, IDC downthe resulting object code through RS-232 serial connections to an AT&T Personal Computer 6300 using MS-DOS and to an NCR Tower

XP. The code was again executed.
"The cable between the 3B2 and the 6300 systems was even unplugged to verify that the program was really executing locally out of memory on the 6300," the report stated. "This verified the portability and downline load capabilities.'

In the second test, the same appli-cation was required to retrieve and update files on the 3B2 and the Tower XP while being executed on the 6300. A subsequent check of each file confirmed the successful completion of the modifications, the report said.

In the final test, the application ran simultaneously on the 6300 and Tower XP, while both machines also updated a file on the 3B2. "Record, not file, locking worked as specified, and the integrity of the data was pre-served during simultaneous access," the report said. A similar test involving a PC AT and Personal Computer XT connected through PC-Net reportedly produced the same results.

"The application program's knowledge of the environment and the location of object and data files is made available to Acebridge and DDA through the use of environment variables, which specify a path where Acebridge will search for the named data or object file," IDC said.

DDA will be priced from \$500 to \$1,000 per node. Austec is negotiating distribution and support agreements with hardware vendors.

Chances are you don't currently audit your operating system—even though it's ultimately in control of information used to manage your organization. And for good reason.

For the most part, you don't audit the system because the software is just too complex. Then too, certain hard data on system controls is usually mavailable. And a manual review would take weeks to perform, require outside experts, and cost too much.

Those are some of the main problems AEX2-Examine/MVS software is designed to solve. This new software package now makes it possible for you to get the information you need to effectively analyze your MVS environment. So when top management asks how you know your data center business controls are working, you'll have the answer.

Through its more than 100 on-line displays, AEX2-Examine/MVS software lets you perform a completely independent audit, right from your own terminal. You interact with the software in a conversational mode, guided by a series of menus.

AEX2-Examine/MVS software gives you a more complete, up-to-date picture of your total operating environment—in real-time. Instead of waiting hours to get a report on system status, you can immediately check the

status of system controls, key system libraries, files and tables.

AEX2-Examine/MVS software also helps your DP staff become more productive by improving their knowledge of the system, its controls, and its level of operating efficiency. In effect, it puts MVS under a cost-conscious

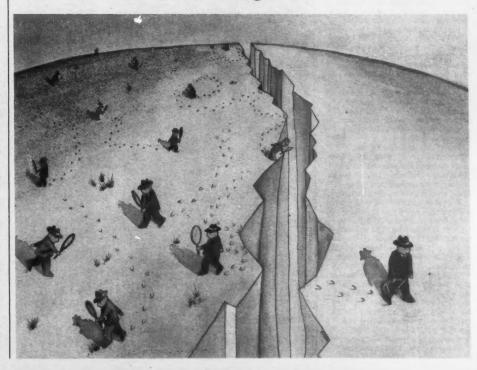
Tighter business controls, more accurate information and improved data productivity are all key management objectives for the coming decade. AEX2-Examine/MVS software provides a tool to help you achieve these strategic objectives today. And positions you to meet your increasingly stringent demand for due care in the future.

For more information, contact Shawn McLaren today, at 1333 Lawrence Expressway, Santa Clara, CA 95051-3595; (415) 941-4558; Telex 357437. AEX2-Examine/MVS is developed and maintained by SKK, Inc., Rosemont, Illinois. are trademarks of SKK. Inc.

The Cambridge Systems Group

Over a decade of strategic software solutions.

# AEX2-Examine/MVS auditing software. Your bridge to the future.



# The high cost of sales hype

From page 25

without the wherewithal to do so competently. The least damaging results are cases in which we spend thousands of hours doing the best we can with tools that are defective or incomplete.

The saddest are those in which the unfortunate buyer sincerely believes the tool can do the job without a craftsman. Consider three tools with which we build on-line data base applications for mainframes: teleprocessing monitors, conversation controllers and data base management systems.

On-line data processing works like a polite conversation — the participants take turns. After pressing a function key, the CRT operator waits, keyboard locked, until the computer responds. Then the computer waits until the person answers and so forth.

Since computers work faster than people, we expect tools for building on-line applications to free the machine automatically for other things while awaiting human response.

Since programs run amok now and then (runaway index, say) we expect the teleprocessing monitor to protect programs from one another. Since transmission costs bandwidth, we expect the conversation controller to transmit and receive only what's changed on the screen since the prior iteration.

Finally, since programs abend or power fails in midflight, we expect the data base management system to notice when something goes wrong and put everything back the way it was, automatically, on its own, without intervention.

### Tortuous programming

Yet most teleprocessing monitors provide no automatic conversation control. They require tortuous and developer-costly programming to avoid putting the partition to sleep after each mainframe-to-CRT transmission. The most widely sold such product vulnerably exposes on-line tasks to each other — one runaway program can overlay and destroy all on-line activity.

Most on-line development packages provide no application-view screen buffer. They inflict the program with raw incoming transmission fields (low values if no transmission, data if there was).

Even Cullinet Software, Inc.'s ADS/Online (the very top of the line, in my opinion) transmits all data fields to the CRT when you ask for a display, regardless of how many fields were altered by the program.

For years, one of the largest selling data base management system packages on the market compelled retrofit. It forced data processors to track down and recompile every program ever written that used a record when that record was expanded with new data.

The instruction manual of another popular DBMS that boasts of automatic recovery warns that it can handle only "planned failures." In other words, its highly touted automatic recovery works only if you carefully shut the system down before power fails or software crashes.

The point is not that tools are

imperfect and are continually improved. It is not even that some features are essential to the very reason for a tool's existence. A knife that does everything but cut is worthless.

Data independence, intertask storage protection, transmission buffering and automatic recovery are as essential to their respective tools as cutting is to a knife. But we all hope to get smarter with years, and tool builders are no exception.

No, the point is that, in each case, competing tools are available that contain these essential features; yet those lacking them sometimes sell more successfully. The reason is that, in contrast to typewriters, violins, radio telescopes or shovels, the people doing the buying are often not the ones who must use them.

A salesman wearing dark-blue suit and white oxford-weave button-

down shirt with black tie once explained why. He confided, "Executives don't buy on the basis of features. They buy based on trust." He reminds me of Kaa, Mowgli's cobra acquaintance in Rudyard Kipling's The Jungle Book: "Trussssssst me."

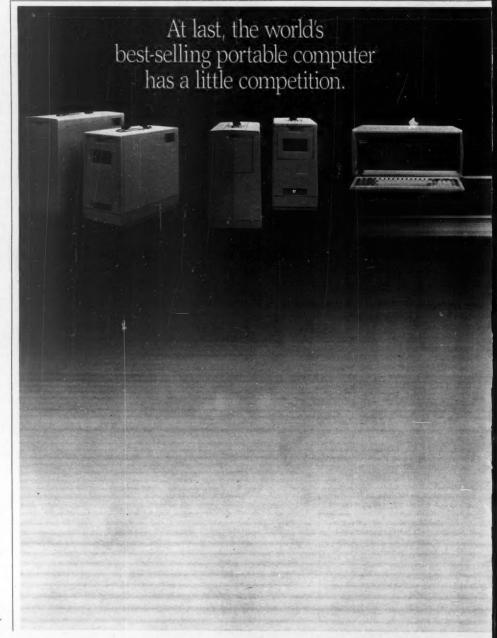
You know, when you think about it, the terms "user-friendly," "relational," "nonprocedural" and "distributed" have something in common. It is this: Any DP professional who uses one of these buzzwords should be summarily dragged out back and shot. The words meant something when first coined. They have since been debased into meaningless noise by vendor puffery. "My data base is more relational!" they scream. "My spreadsheet is more user-friendly! My cigarettes are milder and more flavorfu!"

Aaarrrggghh.

The cost of misguided tool selection, in inadequate applications, bloated DP staffs or inflated hardware configurations, must be staggering. But it pales in comparison to the cost of tools without craftsmen.

When microcomputers first began to proliferate in firms with mainframes, many data processors feared becoming casualties of the micro revolution. Control and security were what we complained about, but the real issue was power. The chill deep in our hearts was that our captive customers would get away. We thought that users' cost issues were their smoke screens to escape.

We were right, of course. The more aggressive users enthusiastically pursuing micros did so precisely in the hope of fleeing the shackles of their glacial DP department. Why



should they wait six months for a report when, with their own equip-ment, they could have it now?

Today the dust has settled. The videogame fad has gone the cyclical way of hula hoops and miniskirts.

Microcomputers in large organizations have fallen into three roles, none of which seriously affects

mainframe data processing. Some are desktop tools for truly stand-alone purposes (word processors). Others download mainframe data and transform it into spreadsheets or graphs - more effective presentations than columnar fanfold reports. (Downloading is cheaper, too — the traditional way of conveying data from mainframe to executive involves grinding up forests.) The rest make splendid doorstops.

The "free at last" phenomenon is not new. It has been with us since

our profession's beginnings. An IBM manual on DP organization, published in 1962, spends a chapter explaining that it's less costly to have one big DP department than for each user to have his own computer, complete with programmers. Birds of a feather train each other.

The distributed processing fad of 1978-1979 was touted as the break-through enabling each user to have his own machine. Today, a "depart-mental machine" wave is building strength - the latest reincarnation of the same flawed reasoning.

#### Hospital trauma

A hospital was trapped in a snarled portfolio of obsolete and unmaintainable applications on an IBM 370. (How they got into the mess is irrelevant to the story.) They understood the vendor to say that if they

bought a System/38, their problems would be solved because it needed no programmers to run it. (The vendor probably said it requires less support because it does less.)

The notion of a self-programming computer matched their dreams, and they bought it. Now they have a 370, a System/38 and even more programmers supporting both. They are still entangled in the same obsolete application portfolio.

A prospect once told a Cullinet executive he was hesitant to buy IDMS. A competing DBMS salesman had assured him that his product would cost less in salaries. It required no data base administrator. The Cullinet executive suggested that the buyer request a list of the competitor's satisfied customers. 'Call one of them. Ask for the data base administrator. I guarantee that

the undisputed world leader in

portable personal computers. And for that title, there's no

For the name of the dealer

nearest you, call toll-free

1-800-231-0900 and ask for

Operator 16. In Canada, call

(416) 449-8741. In Europe, telex

84117898630AB; 898630

IBM is a registered trademark and IBM PC/XT a trademark of International Business Mack Corporation. 91985 COMPAQ Computer Corp.

competition.

COMPAQ TTX D.

someone will answer the phone."

In 1971, South American revolutionaries took over a profitable service bureau and fired the "capitalist technocrats" who ran it. The abandoned machines were rusting within a year.

In each case, the reasoning seems to be that if one buys the right brand of canvas, it will paint a masterpiece on its own. The reasoning is flawed because what limits success is and always has been talent, not tools. There is a knack to building applications, a learned skill. Talented people, plus their instruments, produce useful results.

Buyers who swallow the notion that a piece of software or hardware can do the job without talented people condemn themselves to Sisyphean disappointment. (Sisyphus, in mythology, was doomed forever in Hades to roll uphill a boulder that always rolled back down.) Sellers who claim their DP product slices and dices without need of talent prey on ignorance, intentionally or not.

Those of us who make a living selling are sometimes tempted to join the crowd and propose such fantasies, especially when the prospect seems ready to fall for a competitor's even-wilder promises. It would be a mistake, though.

Our industry is maturing. Longterm cuștomer satisfaction, not an immediate sale, is what counts. And over the long pull, it is the tool user, not the tool buyer, who must be satisfied - today's programmer is tomorrow's vice-president of MIS. Software vendors might take a lesson from the dinosaurs. Extinction, you see, is nature's gentle way of suggesting you made a slight mistake.

### **DEC** system targets utilities

From page 25

ago. The DBMS was developed by the

The data base was designed to integrate a variety of applications, in-cluding gridding and contouring, computer-aided mapping, remote sensing, seismic interpretation and modeling, well-log analysis and res-

ervoir simulation, Moore said.

It is supplied with an interface that provides a menu-driven access to the system. End users may access files by recognition instead of recall. Experienced users may define commands without following a menu sequence, while programmers may use the interface's menu command builder, menu structure editing and prototyping, Moore said.

An assortment of file and graphics utilities aids in making use of the information stored in the DBMS

A domain manager controls user access. An interactive editor permits the creation and modification of graphics or text data.

A data scanner checks for errors, calculates fields and verifies records. A topology builder generates complex data structures from simple data elements. A graphics module allows the construction of 3-D graphics.

In addition to utilities and petroleum exploration firms, Spatial/II is targeted at government agencies and the telecommunications industry, Moore said.



ersonal compute

Expandability? An optional 10-Megabyte fixed disk drive

stores over 5000 pages of data; the optional 20-Megabyte fixed disk drive, twice that. RAM

expands to 2.1 Megabytes with-out an expansion slot, and with

one expansion slot RAM can

expand to 4.1 Megabytes. Since interfaces for the most popular peripherals are already built in, the two expansion slots can be

can run all the popular business software written for IBM Per-

sonal Computers. At speeds three to five times faster than the COMPAQ Portable, IBM PC/XT,<sup>MA</sup>

It's more computer

in less space

Never before has a computer

this small been capable of so

much. Making the COMPAQ PORTABLE II 30% smaller and

and other compatibles.

# How to Create an Integrated Relational Database Solution.

**MAINFRAMES** 

DISTRIBUTED

SOLUTIONS

MINIS

Start with high performance SQL. Add integrated application development tools. Provide a distributed solution (compatible with IBM, DEC and UNIX). And rely on the industry's finest service and support. Only INGRES can deliver the entire package.

HIGH PERFORMANCE SQL

INTEGRATED APPLICATION

DEVELOPMENT

HIGH PERFOR-MANCE SQL

INGRES/SQL is broadly compatible with IBM's DB2. Plus INGRES outperforms other Relational DBMS systems. So you'll have an RDBMS that gives your users maximum productivity because the software is faster.

What's more, INGRES/SQL provides you with the high levels of data security, integrity and consistency you demand.

# 2 INTEGRATED APPLICATION DEVELOPMENT

INGRES is the SQL RDBMS that gives you complete and fully proven integrated application development tools.

You'll have a comprehensive 4th generation application development environment that includes INGRES/APPLICATIONS 4GL; Visual Programming tools for designing forms, queries, reports and graphs; and interfaces to COBOL, FORTRAN, C, PL/1, ADA, PASCAL and BASIC. With each function tightly integrated through INGRES's extended data dictionary.

The result is unprecedented productivity in application development. For both programmers and end-users.

MICROS

Applications evolve easily and naturally. INGRES tools can be integrated and intermixed at will. You get flexibility while you maintain control over each step in the development process.

# 9 DISTRIBUTED SOLUTIONS

With INGRES, you can put one database to work even if you have to deal with different hardware. Users can share data and applications across different operating environments. Including the IBM VM/CMS, DEC VAX/VMS and UNIX operating systems (soon, INGRES will be compatible with many other operating systems).

### Join us for a free ingres suminar.

Call (800) 4-INGRES for a reservation.

Atlanta, GA Washington, DC San Francisco, CA Chicago, IL St. Louis, MO Montreal, Canada Boston, MA Pittsburgh, PA

Denver, CO Philadelphia, PA Los Angeles, CA Minneapolis, MN Seattle, WA San Jose, CA Ottawa, Canada Vancouver, Canada San Diego, CA

Pholins, AZ
Dullas, TX
Houston, TX
Houston, TX
Portland, OR
New York City, NT
Cieveland, OH
New Orleans, LA
Orlando, FL

And you can even link your IBM PCs to the database with INGRES/PCLINK.

For your users, INGRES provides transparent access to databases on remote computers in your network. While

eliminating time-consuming upload and down-

load steps.
Multiple,
inconsistent
copies of data are
reduced. And the

quality of information used in your company is improved.

# EXCEPTIONAL SERVICE AND SUPPORT

To us, even outstanding software is not enough. That's why we've set exceptional standards for service, support and education.

Training is available at Regional Centers or on site. And free, unlimited telephone consulting is there when you need it. With a 24-hour a-day, 7-day-a-week hotline.

So look into the INGRES advantage. You'll see why customers in over **3,000** installations already enjoy our unique integrated relational database solution. For more information, send in the coupon today. Or call toll-free (800) 4-INGRES.

### **Relational Technology**

1080 Marina Village Parkway, Alameda, CA 94501

W.					The state of the
Yes.	Send m	e more i	nformi	tion ab	out
ING	RES: th	e integra	ated re	lational	database
solu	tion.				

Name
Title
Organization M/S
Street

Phone
Send to: Relational Technology, 1090 Marina Village Parkway,
Alameda, CA 94501.

PIGRES/SQL, INGRES/PCLINK, INGRES/APPLICATIONS and Visual Programming are registered trademarks of Relational Bechnology IBM, VM, DR2, CMS and IBM PC is trademarks of International Business Mischines Corporation. DRC VAX and VMS are trademarks of District Resident Corporation. IDMX in trademarks of ADDE

INGRES. SQL Plus AWhole Lot More.

# **MICROCOMPUTERS**



SMALL TALK

### Radical change in PC software

his is a clean-slate approach to exploiting personal computer hardware, that may turbocharge today's applications and radically change the way users deal with today's machines. It's coming in the not-toodistant future from Lotus Development Corp. and - surprise - it's not a

In fact, Lotus' principal technologist, Jerry Kaplan, outlined the scheme sev eral times, the first being at the Lotus Developers Conference earlier this spring. The reasoning goes like this:

"The design of the present generation of PC programs reflects the constraint of the mainframe environment and the discipline of structured programming," he said. "Neither of these are particularly well suited for PCs. PCs are not miniature mainframes; they are used by different people and for different purposes."

With microcomputers, "we have an individual user working through a known interface with a predictable load and known resources," Kaplan pointed out. "This stability explains why micro software is more effective in general than mainframe software - PC applications have fewer design constraints.

In mainframes, he continued, the operating system really can't make intelligent decisions about what to do with its resources. Usually it knows only that there is a need for the CPU or for some device or file or data. Applications thus are designed to minimize computation See RADICAL page 42

Bender is Computerworld's senior editor, microcomputers.

# Package plugs real-time data directly into 1-2-3

WILMINGTON, Mass. Laboratory Technologies Corp. late last month announced Labtech Real Time Access, a \$195 software package that allows popular Microsoft Corp. MS-DOS applications to display, access and analyze real-time data from industrial and laboratory processes.

Real Time Access allows technicians, scientists and engineers to work with realtime data without having to develop special routines for data transfer, control timing loops or instrumentation drivers, the supplier said.

The software is the first data acquisition/analysis package that directly plugs real-time data into Lotus Development Corp.'s 1-2-3, according to Frederick Putnam, president of Laboratory Technol-

Competitive products generally require

custom applications for data analysis, he said. "Real Time Access brings this kind of real-time monitoring into that Lotus standard for the first time

#### Option to Labtech Notebook

Real Time Access works as an option to the \$895 Labtech Notebook, which the firm claims is the most popular personal computer-based data acquisition package.

Previously, Labtech Notebook could collect the data, but to move it into another package required putting the data on disk and then bringing it into the other package," Putnam noted. "Real Time Access eliminates the disk and moves data in the other package directly through memory. It turns out to be 10,000 times faster to transfer data to a Lotus spreadsheet.

The ability of Labtech Notebook and

### INSIDE

Alloy accelerator board supports dual tasking/32

Ideassociates software permits four IBM PCs to share a 5251 emulation card/40

### **NEW THIS**

- University of California at Berkeley offers Turbo Pascal graphics tools
- For more on this and other new products, see pp. 85-113.

# High-end graphics tools debut

### Supports IBM's EGA, 2.000-image data base

By David Bright CAMBRIDGE, Mass. — Visual Communications Network, Inc. (VCN) last month introduced a high-end business graphics software package that supports IBM's Enhanced Graphics Adapter (EGA). The VCN Concorde, a \$695 package, operates on the IBM Personal Computer XT and AT on a stand-alone basis or with spreadsheets exporting Data Interchange Format files such as Lotus Development Corp.'s 1-2-3. "This is the year of graphics," VCN Chairman Hoo-min D. Toong declared.

Toong said that corporate users and consultants require better graphics than those provided by programs such as Lotus' 1-2-3 and Symphony. "Graphics needs have grown from simple bar graphs," he said.

Toong stated the success of VCN Exe-

cuvision, the company's first graphics package, bears out this trend. He estimated about 30,000 copies of VCN Execuvision have been sold since the product's introduction two years ago.

The new package's features include animation, freehand screen painting, text manipulation and self-running presentation capabilities. The painting capability provides multiple-level zoom, a choice of 64 colors and complete scaling.

Fifteen high-resolution and 15 mediumresolution text fonts that can be scaled. tilted, shadowed, colored or underlined are available. These features can be integrated with charts and other traditional business graphics created by VCN Concorde.

The package comes with a data base of over 2,000 icons, symbols and images. Users can also create their own logos and images and add them to the data base. Output media include 35mm slides, overhead transparencies and printer hard copy. The software is currently available.

### INSTANT ANALYSIS

"The Intel 80386 allows us to create virtual software machines. ... There's not going to be a single operating system of choice. Things like LISP operating systems may find themselves coresident in this kind of architecture with Unix and MS-DOS.

- Neil Colvin, chairman, Phoenix Technology, Ltd.

### ORACLE WINS T 5 DATABASE DERBY

The 1985 Database Derby pitted the world's leading DBMS companies against one another in Chicago.

The contest? Implement a complex, real-life application using state-of-theart DBMS technology.

The objective? Measure productivity gains, ease of use and raw power of the contestants' DBMS products.

The winner? ORACLE, from Oracle Corporation. Both overall, and in each and every category.

The second Database Derby will be held in San Francisco during the month of August, 1986. We look forward to seeing Cullinet, ADR and the rest of the database thoroughbreds in this year's run for the roses.

If you'd like to know more about the Database Derby, and how ORACLE wound up in the winner's circle, join us for a free half-day seminar at a city near you. Call 1-800-345-DBMS, or write Oracle Corporation, 20 Davis Drive, Belmont, CA 94002.

And check our full-page ad earlier in this issue for further details about ORACLE.

# DRACLE

Compatibility • Portability • Connectability

Copyright © 1986 by Oracle Corporation. TRBA.

### MICROCOMPUTERS

### Accelerator board reportedly allows IBM PC to run two tasks at once

FRAMINGHAM, Mass. — Targeting the "most demanding" personal computer users, Alloy Computer Products. Inc. late last month introduced an accelerator board that reportedly allows IBM Personal Computers to run two tasks simultaneously. More than 20% of the installed base of IBM Personal Computers, Personal Computer XTs and ATs would have a need for such a product, Alloy product manager Dave Friesen claimed.

The \$995 Bi-Turbo board also provides disk caching and a private RS-232 port for second task use

According to Friesen, Bi-Turbo is

compatible with all IBM PC software and should appeal to users who would otherwise use multitasking programs such as Microsoft Corp.'s Windows or IBM's Topview.

Bi-Turbo allows lengthy tasks such as invoicing along with a spreadsheet or other application, Friesen said. For single applications, users can choose between the IBM PC's processor or Bi-Turbo's 8-MHz NEC Corp. V20 processor by means of a hot key.

Instead of replacing the main system's processor or having it function as an I/O processor, the board assigns one processor to each task.

## Hyperdrive 2000 release postponed until late summer

### Bug found in internal hard drive for Mac Plus

By Peggy Watt CAMBRIDGE, Mass. — Buyers of Apple Computer, Inc.'s Macintosh Plus are installing hard disks in greater numbers than purchasers of earlier Macintosh versions, according to John Ison, director of product planning at General Computer Corp.

But they are not yet able to buy General Computer's Hyperdrive 2000 internal hard disk drive and co-

processor board, announced at the Macintosh Plus introduction in January, because release of the product has been pushed back until late sum-

'Synchronizing the coprocessor turned out to be harder than we expected," Ison said. He claimed the product was well into beta-testing when a bug was discovered, and the release date was revised to allow a complete design review and a new test schedule.

The new Hyperdrive 2000 will cost \$3,195. It will replace the Macintosh CPU with a 12-MHz Motorola, Inc. 68000 microprocessor and include a 20M-byte internal hard disk drive, another 1.5M bytes of randomaccess memory on the board and a floating-point 68881 coprocessor for mathematical calculations.

Upgrade kits to move from General Computer's 10M- to 20M-byte Hyperdrive models, in both the original and Macintosh Plus-compatible versions, to the Hyperdrive 2000 will be available for \$1,899, according to

General Computer already offers an upgrade kit for current owners of Hyperdrive hard disks who are upgrading their 128K-byte or 512Kbyte Macintosh to a Macintosh Plus.
To ensure the Hyperdrive's com-

patibility with the new 800K-byte disk drive, General Computer sells an \$89 upgrade with new system software, Hyperdrive read-only memory, drive bracket, cable and manual.

Macintosh owners who used thirdparty upgrades and replaced their system's logic board need a \$299 General Computer upgrade that also includes a new Hyperdrive controller

### Hyperdrive family prices cut

With shipment of the Hyperdrive upgrades, General Computer also dropped prices on its Hyperdrive family, originally introduced in November 1984.

The 10M-byte Hyperdrive now sells for \$1,399, down from \$1,699; the 20M-byte disk costs \$1,699, reduced from \$2,199.

Scheduled for release in June is General Computer's Hypernet, \$295 file server software that allows as many as 32 Macintosh computers to share files, storage and programs on an Appletalk network. It is said to support the Corvus Systems, Inc. Omninet semaphore protocol for compatibility with multiuser application programs.

As a feature unique to General Computer, Hyperdrive internal hard disks do not void the Macintosh warranty when installed by a dealer.

Apple's recent shuffling and prun-

ing of its dealers hit a few Hyperdrive dealers, who were cut by Apple but left carrying General Computer's accessories, Ison said. The hard disk company then beefed up its financing, support and marketing programs for its 1,500 dealers.

General Computer will retain dealers that wish to carry Hyperdrive, despite a lack of Macintosh microcomputers.



NBI unravels the mystery surrounding PC networking.

NBI was one of the first companies to recognize that isolated PCs often cause as many problems as they solve.

So we took a long, hard look at PC networking. And figured out how to do it right.

In fact, we've been networking PCs longer and better than any other office automation

The NBI PC networking system, which we call "clustering," is completely compatible with IBM and other mainframes. And we let you hook all of your existing IBM PCs together.

NBI offers you a total solution, including cabling and software support. At an excellent price. We're also recognized as having the best service record in the industry.

So don't weave a tangled web. Call 1-800-922-8828, ext. 505 or fill out this card so we can start unraveling the mystery surrounding PC networking.

NBI, Inc., 3450 Mitchell Lane Boulder, CO 80301 1-800-922-8828, ext. 505				
Title				
Company				
Address				
City	State	Zip		
Phone ( )		C		

A STUDY COMPARING DEC, PYRAMID, SUN, AND SEQUENT LED TO THE FOLLOWING CONCLUSIONS...



# RTHE DECS.

The Practical Parallel never runs slow because it's based on parallel technology.

And you never pay for what you don't need. Because you can grow your system instantly from 3 to 21 MIPS in a single system by simply

adding more processors.

It's like getting an entire DEC product line in one box.

The Practical Parallel supports UNIX 4.2 bsd and System V concurrently. So it runs a ton of software for database applications, software development, office automation, or any other UNIX application.

What about reliability? Relax.

The Practical Parallel has a proven MTBF of over 11,000 hours. That's more than a year without a failure.

And thanks to our parallel architecture and automatic reconfiguration, even if your system does fail you should be able to bring it right back up again.

Okay, we know all this sounds almost too good to believe.

But Texas Instruments and Hughes Aircraft and General Electric and dozens of other major companies already have Sequent systems up and running at over 80 sites around the country.

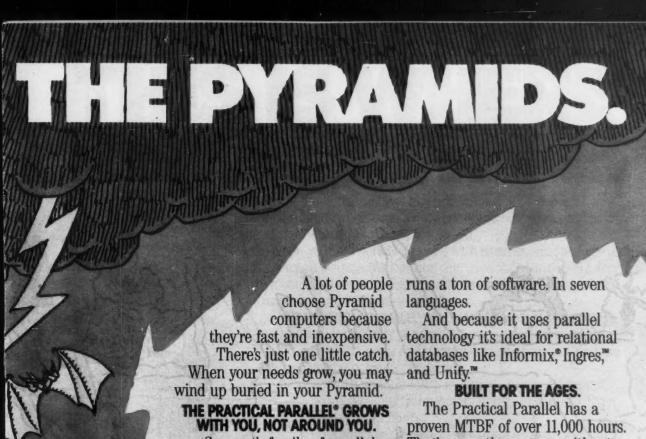
For your copy of our 1986 multiuser benchmark report, call 800/854-0428. Or write to us at 15450 S.W. Koll Pkwy., Beaverton, Oregon 97006-6063.

We'll show you how to get a high performance UNIX system without digging yourself into a hole.



© 1986 Sequent Computer Systems, Inc. The Practical Parallel is a registered trademark of Sequent Computer Systems, Inc. UNIX is a registered trademark of AT&T. DEC and VAX are registered trademarks of Chicital Engineers Corporation.





Sequent's family of parallel computers will keep you from getting buried no matter how much your needs grow.

It lets you go instantly from 4 all the way up to 30 processors in a single system. From 3 to 21 MIPS.

The best any Pyramid system can do is 5.5 MIPS.

And the Practical Parallel has a lot better price/ performance than any Pyramid.

> Naturally, the Practical Parallel runs UNIXº 4.2 bsd and System V concurrently. And offers Ethernet™

> > with both Pyramids. TCP/IP and NFS." So it

That's more than a year without a failure.

And thanks to our parallel architecture and automatic reconfiguration, even if your system does fail, you should be able to bring it right back up again.

Okay, we know all this sounds almost too good to believe.

But AT&T Bell Labs and Tektronix and Purdue University and dozens of other major companies already have Sequent systems up and running at over 80 sites around the country.

For your copy of our 1986 multiuser benchmark report, call 800/854-0428. Or write to us at 15450 S.W. Koll Pkwy., Beaverton, Oregon 97006-6063.

And stop slaving away over your



## THE S



## THIS IS WHERE UNDON'T SHINE.

Sun is one of the hottest names in workstations.

But there are times when even a network of the best workstations can't take the heat. Not Sun. Not Apollo. Not PC/AT.

Like when your network is jammed with users sharing a single data base. Or when a single workstation gets overloaded with work. Or when you have so many users, multiple workstations are just too expensive and too hard to handle.

#### THE PRACTICAL PARALLEL® WILL MAKE YOUR SUN SHINE AGAIN.

Sequent's family of parallel computers lets you offload some of the users or data intensive applications that are causing network congestion.

With up to 21 MIPS in a single box and dynamic load balancing, your system never slows down. Even during peak hours.

And it's easy to add more users because you can instantly add more power. In whatever increments your workload demands.

Naturally, the Practical Parallel runs UNIX® 4.2 bsd and System V concurrently. So it runs a ton of software for any UNIX application.

And Sequent gives you all the software you need to talk to your favorite workstation. Ethernet™ with TCP/IP. NFS™ distributed file system. Even software that lets you turn your PC into a windowed UNIX workstation.

The Practical Parallel has a proven MTBF of over 11,000 hours. That's more than a year without failure.

And thanks to our parallel architecture and automatic reconfiguration, even if your system does fail, you should be able to bring it right back up again.

Okay, we know all this is hard to believe.

But Siemens and MCC and Argonne National Laboratories and the University of Texas and dozens of other major companies already have Sequent systems up and running at over 80 sites around the country.

For your copy of our 1986 multiuser benchmark report, call 800/854-0428 or write to us at 15450 S.W. Koll Pkwy., Beaverton, Oregon 97006-6063.

And let your workstations shine again.



© 1986 Sequent Computer Systems, Inc. The Practical Parallel is a registered trademark of Sequent Computer Systems, Inc. UNIX is a registered trademark of AT&T. Ethernet is a trademark of Xerox Corporation. NPS is a trademark of Sun Microsystems, Inc.



#### MICROCOMPUTERS

#### Tool said to give four IBM PCs emulation capabilities via single board

By David Bright

BILLERICA, Mass. — Responding to increased demand for links between IBM Personal Computers and System/34, 36 and 38 minicomputers, Ideassociates, Inc. has developed software enabling four IBM PCs to share an IBM 5251 emulation board.

The \$495 Ideacomm 5251/ Share resource-sharing package sharply reduces the cost of 5251 terminal emulation, according to Leslie Lord, product manager. Lord said the package is targeted for users who may only connect to the host minicomputer about 15 minutes per day.

Ideassociates also added IBM 3180 terminal emulation to the board as well as the ability to display up to four concurrent host applications

in windows

In a multiple IBM PC configuration, one micro functions as a server, and as many as three others can be connected via RS-232 ports or asynchronous modems. The server PC can also operate as a stand-alone workstation, and the connected PCs can access either the server's printer or the mini's printer.

Since the 5251/Share soft-

ware always runs in the background, the server's session is not interrupted when one of the connected IBM PCs accesses the host.

While data travels between the server and the host at 1M bit/sec., the IBM PCs connected to the server are limited to a 19.2K bit/sec. transmission rate.

Available this month, the improved Ideacomm 5251

card retains its original price of \$895. A complete package with Idea 5251, Ideacomm 5251/Share, an Ideamini card with two serial ports and cable costs \$1.495.

#### PC local-area net resellers form group

By Stanley Gibson

Pooling their resources to gain national stature, several personal computer local-area network resellers recently formed an organization called the LAN Group.

"The best way of thinking about it is as a national distributor with offices in different cities," offered Jay Leifheit, president of Tel-Matic Systems, Inc. of Toledo, Ohio, one of the member companies. The group will enable its members to sell to large end users that have networking needs in widely separated locations, Leifheit explained.

The LAN Group is now forming a Delaware corporation to be owned equally by group members, although it is unclear where the corporate headquarters will eventually be located.

Each member company is about equal in size and expertise, with company sales of roughly \$10 million annually, according to several group members.

There are no plans at this point for a merger of the member companies.

Companies forming the LAN Group are: Tel-Matic Systems; Costa Distributing, Inc., San Francisco; Cache Data Products, Inc., St. Louis; Comtec, Inc., Roanoke, Va.; Microserv Technologies Corp., Needham, Mass.; and CPU Corp., Houston.

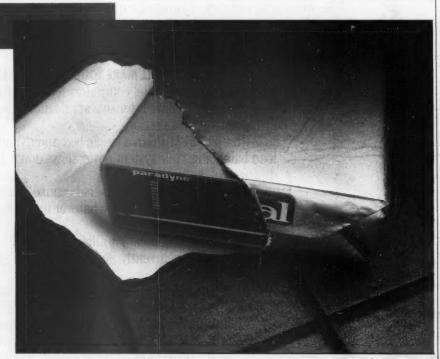
Most of the companies sell Novell, Inc. network products and ITT personal computers.

Over time, the member companies expect to look more and more like one nationwide distributor. Leifheit said the group has been working together for the past six months establishing member guidelines.

#### SUPER ORACLE™ REPORT WRITER

Create complex reports from your Oracle database with easy one step process. Report format and logic very flexible. Versions for VAX/VMS, IBM PC. Demos available. Contact Stem Consulting, P.O. Box 21171, Cleveland, OH 44121, (216) 397-0551.

> Oracle is a trademark of Oracle Corporation



#### Aren't you glad we have dial?

Paradyne presents dial modems with the same high performance you've come to expect from our leased-line modems.

Paradyne's family of dial modems offers the capabilities right for you—at speeds from 1,200 to 12,000 bps.

All models have a wealth of features, like Auto Call and Auto Answer. Automatic equalization and error correction. Plus the flexibility of standalone and nestmount versions, for sync and async applications.

FDX 12/24—Full duplex 1,200 and 2,400 bps dial modems FDX/PC—Card version for IBM PCs and compatibles HDX 9600/208B—Half duplex 9,600 bps modem with Bell 208B alternate rate of 4,800 bps

HDX 12000—At 12,000 bps the fastest dial modern available

Paradyne answers the call for dial moderns with leased-line capabilities. Backed by our extensive service network around the clock. For more information dial—

1-800-482-3333.

paradyne



## It took vision to heat sand and soda to create the unique utility and beauty of glass.



It took similar vision to blend utility and beauty to create the not new OVT 101 PLUS...

terminal does so much. Or looks so good, it gives you features you if find only on terminals arming at least \$100 more.

This is function keys.

Figures at memory, And the wild it is resident as you want to the control of the contr

Its styling will enhance any office decor.

And with the resources of ITT Qume behind you, your choice in terminals is crystal clear, Call 800-223-2479. Or write 2350 Qume Drive, San Jose, California 95131. HT Qume. The company with peripheral vision.

THEOUNE

akes penioneral vision

#### MICROCOMPUTERS

#### Radical change in PC software

From page 31

between input and resource and to relinquish the CPU while they're waiting for input.

But with PCs, Kaplan said, "allocating of resources is the responsibility of the application, and it can perform this task a lot more intelli-

Kaplan proposed a program architecture "based on the principle that the machine's resources should be fully occupied at all times.

This "strategic programming" would replace the standard mainframe read/process/output scenario with a read/prioritize and queue/

execute setup.
"This architecture separates the order of requests from the order of execution," Kaplan explained. "Requests can be processed in any order, as long as the world is 'consistent' after each operation. It allows the application to allocate resources intelligently, using knowledge of the specific problem and environment."

Going one step further, requests are broken into as many pieces as possible, so the scheme becomes read/decompose/prioritize and queue/execute incrementally.

This is crucial to the scheme not just doing background tasks per se, but breaking all tasks into minimal units.

Okay, here's the payoff: "If the units are small enough, the time required to execute a given unit may not be noticeable to the user. Under these conditions, the user is never

locked out from the application."
Among potential benefits, the system now can update the screen before completing an operation, precompute potential Next screens, anticipate costly future commands, perform internal housekeeping in background or accept new requests

while performing old ones. But more strikingly, the micro also can charge into tasks that previously were infeasible: identifying data base inconsistencies, checking grammar, creating user profiles, performing inferences and making suggestions to the user.

In a film shown at its annual meeting, Lotus jokingly acknowledged the uneasy feelings that aggressive micros might raise. In one slide, a Macintosh displayed a "Mac Critic" window asking, "You're not going to

wear those shoes, are you?"

"In what we're calling mixed initiative systems, the program as well as the user can initiate action," Kaplan remarked. And yes, that does seem a little different.

A related design goal is to let us-ers give vaguely defined orders, as in Lotus' upcoming HAL add-on for 1-2-3. However, another issue comes up as the computer begins humming away happily at these tasks — in Kaplan's words, "the notion of damage within a program." You want the system to say, "Are you sure about that?" if you tell it to reformat a hard disk, for example.

This all would produce fundamental changes in the way people deal with computers — getting used to computers initiating action and getting used to relinquishing a certain level of direct authority. These con-cepts haven't bothered those who have seen them so far, but those are programmers rather than regular folks. Kaplan admitted.

And, of course, this all presupposes a single-user, single-tasking environment. "When you need outside resources, that assumption is blown," Kaplan said. "You really need a way to tell the operating system how important tasks are.

#### **Borland releases** enhancement tool for Reflex use

SCOTTS VALLEY, Calif. — Borland International, Inc. has announced Reflex Workshop, a \$69.95 enhancement tool with built-in vertical applications for use with its relational data base manager Reflex, The Analyst.

The package consists of a 250page workbook and diskette with 26 working examples of common data base applications, including personnel file maintenance, accounting, order entry and scheduling. Some drawn from actual in-house applications, and others handle tasks reflected by frequent calls to Borland's technical support, said Joanne Sakai, technical support assistant manager.

"A lot of people have been asking for ways to get started," she said. "Many of our calls are applicationoriented and less technical prob-

Reflex Workshop runs with Reflex on the IBM Personal Computer and compatible systems and requires at least 384K bytes of random-access

memory and a graphics board.

Reflex Workshop is scheduled to be available this month. Borland will bundle it with Reflex for \$199.95

during an introductory period.

The Workshop's data base models are divided into four main categories: finance and accounting; administration; sales and marketing; and production and operations. Specific uses are included in each category, with examples of how to employ the data within Reflex and how to customize data bases for individual use.

Reflex offers five ways to view data, including forms, lists, graphs, reports and cross-tabulation charts. It also accepts data from several popular spreadsheet programs and other data base management systems.

#### MADE FOR EACH OTHER.



Just like Topaz Power Conditioners and your computers.

Noise transients, voltage fluctuations, blackouts-all are problems for computers. But Topaz eliminates these problems with a full range of products: LINE 2° Power Conditioners, ULTRA-ISOLATOR° Noise Suppressors and POWERMAKER' Uninterruptible Power Systems.

Reliable. Affordable. Efficient. Our products are ideal for use with all computers, from micros to mainframes. Call us today at (619) 279-0831. After all, we're made for each other.



For your FREE copy of our 16" × 20" MADE FOR EACH OTHER poster, please tear out this ad and send it to us alor Mail to: Topaz, Inc. 9150 Topaz Way, San Diego, CA 92123-1164.



Fifteen years ago, the typical business soft-ware yendor worked with an R&D budget that

could just about lace up his sneakers.

That's because the head of R&D was also the president, the sales manager and the night watchman. And his office was in the eaves over his garage.

Those were the frontier days of the software industry, when you had umpteen hundred vendors vying for a place in the sun.

And every one of them was a one-package

startup setting forth with a disk and a prayer. Of those umpteen hundred, very few have stood the test of time. As one who has, we can tell you that shoestring budgets and single-package technology may have gotten us started. But they aren't what made us grow into the McCormack & Dodge of today. A global company offering a broad, integrated constellation of products.

The borderless technology that links our

multiple packages was not created out of thin air. It took teams of well-paid talent. It took money. As a Dun & Bradstreet company, we can

count on having the financial resources for true R&D. The kind that lets us develop products for the distant future, not just for the short-term

So when you go looking for today's leading edge software, remember we're already working on tomorrow's.

#### McCormack & Dodge

The Dun & Bradstreet Corporation

#### MICROCOMPUTERS

#### Package plugs in real-time data

From page 31

Real Time Access to run on inexpensive personal computers should broaden the market for data acquisition products. Putnam predicted.

'It used to take a \$70,000 computer to do real-time analysis. Now all you need is 512K bytes and Lotus," he said.

With Real Time Access, information from data gathering devices can automatically update spreadsheets, giving scientists and quality controllers the ability to continuously monitor assembly lines and experiments.

'This package cuts across all types of research activities, industri-

al quality control and industrial manufacturing process activities," Put-nam said. Key markets for Labtech the petrochemical, chemical, pharmaceuticals and automobile industries. Sales are also expected to medical schools and universities.

#### **Key applications**

Key applications include statisti-cal process control, custom process monitoring, security systems, physiological monitoring, electronic testing and energy management systems.

One example of the use of Real Time Access, Putnam suggested, is in monitoring engine pistons coming off an assembly line.

'If the piston goes outside of the limits which are derived from statistics that are calculated on-line by a spreadsheet, you get an alarm. Then a worker goes over and adjusts the equipment so the pistons are produced within spec," Putnam said. "What we are bringing with Real Time Access is the capability to do all of that on-line and to do the whole thing in a Lotus spreadsheet.

Laboratory Technologies eventually butt heads with Lotus, which plans to introduce products for engineering and scientific data acquisition and analysis.

We have kind of a funny relationship with them, because rumor has it that they are working on a product to do similar things to what our product does," Putnam said.

In fact, Lotus recently released a catalog of scientific products that are compatible with Lotus software, which included Labtech Notebook.

Real Time Access will ship in July. It is scheduled to rise in price to \$295 in October. The menu-driven program runs on IBM Personal Computers and compatibles with at least 512K bytes of random-access memo-

In addition to 1-2-3, Real Time Access is compatible with many popular applications such as Lotus' Symphony, Ashton-Tate's Dbase III and Mathsoft, Inc.'s Mathcad.

The package also is compatible with a wide range of vertical and cus tom-written applications, according

to the vendor.

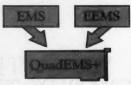
Both Real Time Access and Notebook are available through IBM's direct sales force under the Labtech logo. Approximately 2,500 copies of Labtech Notebook have been shipped so far. Putnam said.

Major corporations such as Polaroid Corp., Ford Motor Co. and Stan-dard Oil Co. are currently using Labtech Notebook.

# Tough Choice. Easy Answer.

#### OuadEMS+

The Only Memory Board For Your PC-XT With Both EMS and EEMS.



Memory And I/O QuadEMS+ delivers 2Mb RAM when you move up to expanded memory.
And supports both expanded memory specifications: EMS and EEMS. Each is independently engineered into the specifications: EMS and EEMS. Ex-independently engineered into the board. Plus, there's a printer port, communications port, and clock/ calendar to enhance your system.

Memory Only Memory Chry
If all you're after is memory,
QuadEMS+ also comes without I/O.
Pure RAM. Either way, QuadEMS+ lets
your system take advantage of the power
of expanded memory without worrying
about compatibility problems that might crop up later

So Smart, It Installs Itself
Available now for your PC-XT and XT
work-alikes, QuadEMS+ is easy to use.
Just plug it in. It does the rest. It's
designed to automatically configure
itself to your system requirements. For more information visit the Quadram dealer nearest you. Or contact us at One Quad Way, Norcross, Georgia 30093; 404-564-5566.

QuadEMS+ is a trademark of Quadram Corp. Quadram and the





#### Cygnet delivers electronic mail retrieval program

By Peggy Watt SUNNYVALE, Calif. — Microcomputer and MIS managers are at the top of the list to receive complimentary evaluation copies of a new memory-resident communications pro-gram, Get, which began shipping last month from Cygnet Technologies,

As part of a telemarketing promotion, Cygnet has already sent out about 100 copies of the \$89.95 pack-age to MIS managers at Fortune 1,000 companies, according to Ken Dickens, marketing director.

According to Dickens, early tests showed that the use of Get doubled or tripled the use of electronic mail in

The 64K-byte package runs on IBM Personal Computer and compatible systems, in background, checking designated electronic mail services at times specified by the user.

If messages are waiting, Get flashes a message in one corner of the screen without disturbing other applications running at the time. The user can then retrieve the message

Get includes a text editor and autodial and file transfer capabilities. Access can also be protected by password.

The program comes with interfaces for MCI Communications Corp.'s MCI Mail, Western Union Co.'s Easylink, ITT's Dialcom, Readers Digest Association, Inc.'s The Source, Compuserve, Inc.'s Compuserve, General Electric Information Systems Co.'s Quickcom and Genie, GTE Corp.'s Telemail, Tymnet Inc.'s Ontyme, AT&T's Mail and other commercial services.

The product can also be programmed to search for and retrieve messages from such other on-line services as bulletin board systems or corporate in-house electronic mailboxes

Get is a spin-off of the Cygnet Cosystem, a computer with built-in utilities and telecommunications capabilities. The Cosystem has moved slowly in the marketplace, and Cygnet has split off several of its pop-up utility programs and sold them separately.



#### Don't count out mainframe

ould this be the start of some thing big? Or, to be more precise and to twist the words of the old song a little more, could this be the start of something small?

There are people on both the user and vendor sides of the computer industry who gleefully point at the less than-spectacular annual and quarterly financial results of mainframe vendors as proof that the mainframe is dead. Those are the people who swear that the personal computer and its asso ciates - the local-area network and departmental processor - have knocked the mainframe into its grave.

But those people are wrong or, at best, premature. They are just as wrong as the mainframe folks were five years ago with their flat declarations that the PC was a toy with no place in the American corporation.

The statistics most frequently cited as proof of the mainframe market hardships are IBM's comparatively weak revenue and earnings numbers for recent quarters. And, of IBM's numbers, perhaps the most critical are the seemingly disappointing order rates for the 3090 series of mainframes. According to International Data Corp. market re search figures, worldwide large-scale unit shipments dropped by 13.6% in 1985, despite the start of 3090 ship-

Some of the blame for the lack of interest in the 3090 may rest with IBM, which has been criticized by users and analysts for not distinguishing the

See DON'T page 46

Connolly is Computerworld's senior editor, systems & peripherals.

#### Minis aid firm's expansion

#### Keeping system abreast of 30%-per-year growth

By Donna Raimondi

LA FOX, Ill. - Richardson Electronics Ltd. scoops up market share in a trailing-

edge technology as it produces and sells electron tubes and power semiconductors. While Richardson's earnings have grown at an average of 30% per year for the past five years, the company's information systems have kept pace and enabled expansion using Pick Systems' Pick-based McDonnell Douglas Computer Computer Systems Co. minicomputers.

A combination of slow but steady growth in the tube market - about 5% a year now - and a dwindling number of companies that produce tubes has helped fuel Richardson's growth. Four years ago, Richardson was a \$25 million company running with 25 employees

The entrepreneurial Edward Richardson, son of Arthur Richardson who founded the company in 1947, took over the reins in 1961, says Eric Powell, vice-president of information systems. Today, \$70 million in sales and approximately 430 employees attest to the success Ed Richardson achieved through his policy of growth by acquisition. This started in the early 1980s, when he became concerned about having sources of supply for the tubes that

As the company grew, the information systems department had to continually grow and change to support it. "Before, we had a Singer System 10 batch computer, and we had Ed Richardson. Ed did the planning, and the computer did the keep-ing track of everything," Powell says.

Now, a recently installed hierarchy of executives relies upon the McDonnell Douglas (formerly Microdata Corp.) M9208 and M9250 systems that run under the McDonnell Douglas' Reality operating system. Seven locations in the U.S. and sites in Canada, the UK and France are connected to the systems via leased lines. In the U.S. and Canada, the company uses an all-digital network connected through Teltone Corp. switching multiplexers. "In the UK and France, we are using conven-tional analog lines," Powell says.

The communications scheme has helped See MINIS page 50

#### INSIDE

Alcyon announces single-board, Unix-based computers for the OEM mart/46

Britton-Lee to use IBM disk drives in its data base systems/49

NCR introduces an aperture card plotter for CAD/ CAM applications/49

#### **NEW THIS** WEEK

- Lee Data offers a plug-compatible replacement for IRM's 3178 interactive terminal
- For more on this and other new products, see pp. 85-113.

#### INSTANT ANALYSIS

"Giants like IBM and DEC can cover many service strategies and, therefore, concern themselves with molding their offerings to meet individual customer

research report

#### Inmos unveils 16-bit Transputer for low-end parallel processors

BOSTON — Inmos Corp., the company that produced the 32-bit Transputer used in Floating Point Systems, Inc.'s FPS T series of supercomputers, recently announced a series of evaluation products based on a 16-bit Transputer designed to be the key processing component in lowercost parallel processing systems.

Inmos said its IMS T212, announced in

Boston, executes up to 10 million instructions per second (MIPS). Inmos' earlier Transputer, the IMS T414, was introduced in October 1985 and is the key processor in Floating Point's massively parallel T series

Like the IMS T414, the IMS T212 report-

edly features 2K bytes of 50-nsec, on-chip, static random-access memory, an external memory interface and four inter-Transputer links that allow multiple transputer connections. Scheduled for shipment in June, the IMS T212 costs \$400.

Other products announced by Inmos included the 10-MIPS IMS M212 disk proces or, for \$300, and the IMS C011 and IMS C012 link adapters, which cost \$35 and \$50, respectively, and are designed to connect Transputers to other manufacturers' peripherals and processors.

Inmos, which is based in Bristol, En-

gland, and has a research facility in Colorado Springs, also introduced its Inmos



## **Is There One Difference Between A Resource Manager** And A Disk/Tape Manager?

No. There are four dozen.

There are 48 reasons why you should have EPIC/VSE-the system that

Here are three of them: 1.EPIC/VSE is the only dataset manager written exclusively for DOS/VSE. 2. EPIC/VSE gives you complete online support, from HELP to Job Accounting, including VSAM display and maintenance.

3. EPIC/VSE allows full device independence (disk and tape)—without changing any JCL or your programs.

A Tower Systems representative will be glad to show you the other 45 reasons. They're all in an Evaluation Workbook that encourages you to compare EPIC/VSE, feature for feature, item by item, directly to the competition. Call Tower Systems now. Because 48 reasons can't be ignored.

EPIC/VSE. The First. The Best 1-800-854-7551 In California: 714-650-4900 2220 Fairview Road Costa Mesa, CA 92627 TOWER

#### Alcyon ships line of VMEbus-based multiuser systems

#### Real-time supermicros run Unix V.2 software

By Eddy Goldberg

SAN DIEGO — Alcyon Corp. recently began shipping a new line of VMEbus-based, real-time, multiuser Unix systems. The 10 supermicros consist of five models, each available in single- or multiprocessor configurations.

The systems can be adapted by OEMs for technical, real-time applications in markets such as factory automation, data communication and medical instrumentation.

The systems support from one to

16 users, with disk capacity from 20M bytes to 450M bytes and a number of I/O options. Alcyon's A68VME single-board computers are based on the VMEbus standard and the Motorola, Inc. 68010 processor. The A68VME reportedly runs at 10 MHz with no wait states.

Alcyon also provides its Regulus operating system, which is AT&T Unix System V.2-compatible and is built around a real-time, multitasking kernel. For applications requiring faster real-time response than is offered by the Regulus system, Alcyon offers a faster real-time kernel on a second board.

The VMEbus multiprocessing system allows developers "to distribute

tasks across nodes and add application software without having to make system software decisions," said William Hughes, vice-president of sales and marketing for Alcyon. He added that in the multiprocessor configurations, one processor can be dedicated to a single task, guaranteeing reponse in a real-time, nonrepeating situation.

Alcyon also sells other software tools including C language compilers and its Distributed File System. DFS is a software package consisting of upwardly-compatible extensions to Regulus to support the interconnection of computer systems via a local-area network.

Alcyon also provides optional soft-

ware such as Fortran 77 and Pascal-2 optimizing compilers, a C language debugger, AT&T Unix System V utilities and a number of application packages.

Prices start at \$7,490 for the single-processor Model 20 and \$11,990 for the multiprocessor Model 20-MP, which support one to two users. At the high end, the Model 450, which supports 12 to 16 users, is priced at \$45,490, while the multiprocessor Model 450-MP sells for \$49,990.

#### Don't count out the mainframes

From page 45

3090 from its predecessors with features that make customers jump at the chance to own one.

With the talk that departmental systems and PCs are going to replace the mainframe, it may appear that the supplantation has begun. But there remains the question of whether there is a market for departmental systems. Also, there is the question of whether the true role of the PC is to take over the processing from the mainframe. It would be interesting to see how many of the PCs sold each year are replacing mainframe-type terminals while retaining access to the mainframe. Is the PC anything more than a very smart terminal?

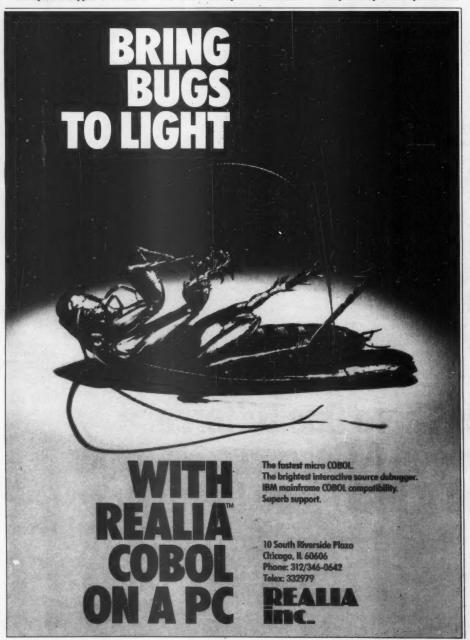
Also, it may be that the primary use of departmental processors will remain for special applications such as computer-aided design. Lately, analysts have begun to say that the key element of departmental processing — office automation — should be a function of a divisional processor. It may be to that market, targeted by superminicomputer manufacturers, that the mainframe will lose the corporate customer.

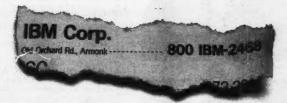
There probably always will be a need for the large batch or data base system, particularly if PCs create the demand for mainframe support that some observers claim.

But if there is need for a distributed data base and for keeping the price of one million instructions per second (MIPS) of power under. \$100,000, then maybe users and vendors are justified in looking closely at the supermini. A 6-MIPS machine may be right to run an integrated office package and applications to support one division of a Fortune 500 company. However, even with that local processing, there still will be the need to access a host's data base for the exceptional request.

It is ironic that what the supermini is offering for power is comparable to what the mainframe offered a couple of generations ago. In the late 1970s — with IBM's 3033 — a high-end system sat in the 6-to 9-MIPS range, rather than the 28-MIPS range they occupy today.

So the dip in the mainframe market may be the result of a sluggish economy, or it may be because the 3090s haven't wowed people. Or, it may just be the start of something big — not what the low-end advocates think it should be, but a reliance on the same scale of system that was a star a few years ago.







# For the next generation of 3X communications, call the number on the right.

When you want to connect your IBM PC to your System 34/36/38, whom should you call?

Call the people on the right and you can emulate the most terminals, including the 5250 (with all 32 display attributes) and the 3180. You can support the latest laser-jet printers, the largest range of system printers, and the most up-to-date file transfer packages on the market—even IBM's. You can do windows and cluster with three other IBM PC's from your workstation. Most important, should you ever need help, the toll-free number on the right will put you in touch with a technical support team whose sole priority is to master PC based products.

Now call the people on the left, and you can

emulate some terminals, a limited number of system printers, and not all of the 5250 display attributes. Of course you'll be able to work with IBM file transfers, but once the goods are delivered, can you work with virtually no support of PC based products?

So before you call the number on the left by force of habit, consider who's really giving you the best solutions in 3X communications. And ask yourself this.

Who should be emulating whom?

**IDEAssociates** 

IDEAssociates, Inc., 29 Dunham Road, Billerica, MA 01821, (617) 663-6678, Telex 4979780; France, Switzerland, Germany, United Kingdon

MA in a continued treatment of International Reviews Machines Cornersigns.

#### Computer service market to grow; vendors' share to increase

Almost 90% of the \$13 billion computer maintenance and support market is owned by the hardware manufacturers themselves, and it looks like those vendors will grab even more market share. Those were the findings of an Input study of the service market.

Input, a Mountain View, Calif., market research firm,

says that the service market continue to grow and that the hardware vendors'

#### HARDWARE NOTES

market share will grow even larger.

addition, the report notes that some smaller vendors have begun offering innovative services, ranging from a heavy reliance on user involvement in service to reliance on redundant cir-

The U.S. Department of Commerce's National Bu-reau of Standards has published a guide entitled Care and Handling of Computer Magnetic Storage Media. The

130-page book outlines how to maintain proper environmental conditions as well as how to handle tapes and

It looks at how extreme environmental conditions and magnetic fields affect storage media, examines the chemical factors involved in storage and lists some of the precautions to take for long-

The publication is available from the U.S. Government Printing Office in Washington, D.C., at a cost of \$5.50.

Memorex Corp. has announced a program that offers increased capacity and peformance to customers who lease or purchase the company's 3680 or 6240 High Density Package disk drives.

The program allows 3680 or 6240 customers to upgrade to future products - a double-capacity disk drive and the 3888-23 disk cache controller, respectively - or to obtain an equivalent configuration of their existing system at any time at a predetermined price.

Zero One Systems, Inc. has completed installation of a Cray Research, Inc. X-MP/ 48 supercomputer at the National Aeronautics and Space Administration's Ames search Center in Mountain View, Calif. The system, valued at \$21 million, will be used for large-scale fluid dynamics, aerodynamic design and analysis, atmospheric modeling and satellite image processing. It currently serves up to 500 users run-ning 1,500 jobs per day. The X-MP/48 is the third

upgrade, following the installation of a Cray 1S in 1981 and a Cray X-MP/22 in

Another Cray Research, Inc. X-MP/48 is being deliv-ered to the Pittsburgh Supercomputing Center, a concomposed Carnegie-Mellon University, the University of Pittsburgh and Westinghouse Electric Corp., according to Cray Chairman John Rollwagen. The X-MP/48 at the Monroeville, Penn., site should be operational this month.

Honeywell, Inc. and data base computer manufacturer Teradata Corp. have signed OEM contract which Honeywell will inte-grate Teradata's DBC/1012 with Honeywell's large-scale computers. The contract is a four-year, nonexclusive mardistribution keting and agreement. No delivery date has been announced.

> ANAGEMENT EPORTING/RETRIEVAL

for THE IBM S/38

For more information Contact Charles White at: michaels, rose & cole, Itd. 800 West Roosevelt Road Building E, Suite 304 Glen Ellyn, II. 60137 [312] 790-5040

## Give us your stained, your dog-eared, your filthy dirty, vour mistreate





Dust (cough-cough)







legular coffee, two lum

Aunt Molly's jam









#### If it's a Polaroid diskette, we'll fix it.



One scoop of ice cream



erhased ink spots

Accidents can be fatal to a floppy disk. Not with Polaroid Professional Quality Diskettes. They are the only ones that come with the new. free data recovery protection-DataRescue. So, if your customer spills a little coffee on our diskette, we can help recover the data. (And with other accidents, too.) Call 800-241-4403 and we will tell you about DataRescue that comes with every Polaroid Professional Quality Diskette. and how to become a Polaroid Professional Quality Diskette Dealer. Addit word by a conferent but were a supporer want there. And it won't be accidental that your customers want these Polaroid Diskettes.

■ Polaroid DataRescuë Protection



#### NCR introduces plotter aimed at CAD systems

#### Follows 3M with 4300 CAD/COM

By James Connoily MOUNTAIN VIEW, Calif. NCR Corp.'s Micrographics Systems Division has introduced an aperture card plotter designed to handle design computer-aided (CAD) plotting on computeroutput micrographics (COM).

NCR's announcement of its 4300 CAD/COM is the second such debut in recent. months, following 3M Corp.'s March introduction of a laser film plotter.

The 4300 CAD/COM was designed to be a higher speed alternative to standard paper plotter outputs. It records a digitized image directly from a CAD workstation onto an aperture card, eliminating the need for a paper plot pri-

or to microfilming.
According to NCR, the
4300 CAD/COM plots with an accuracy equivalent to a high-quality 200 dot/in. paper plot. The company also said that images are pro-cessed and indexed in less than three minutes. The system includes a printer designed to produce eye-readable titles across the top of the card for filing and sort-

The 4300 CAD/COM was designed to interface with nearly all CAD systems via a Versatec, Inc. or compatible processor and can be adapted for use in a personal computer environment. It uses a dry silver film that is intended to eliminate the need for chemi-

The system is 13-in. high by 371/2-in. wide and 18-in. deep. It will be sold through third-party channels prices ranging from \$38,000 to \$45,000, depending on the configuration. Deliveries are scheduled for late this year.

#### Firm claims 'breakthrough' in thin-film manufacturing

By David Bright SANTA CLARA, Calif. — Information Memories Corp. recently announced what it terms a "significant break-through" in the manufacture of thin-film-plated media for hard disk drives.

The new K-2-S process should result in lower 31/4-in... 514-in. and 8-in. disk drive prices and greater disk drive accuracy, according to mar-

keting manager Mary Eckert. Information Memories, a subsidiary of Xebec Corp. of San Jose, Calif., supplies hard-disk platters to drive manufacturers such as Syquest Technology and Maxtor Corp. So far, the platters have been coated with a sputtered carbon layer. Sputtering is a dry, vacuum meth-od of coating the platters, while the K-2-S process applies a wet coat.

K-2-S is less costly than the traditional sputtering method and creates a thinner coating at least as durable and corrosive resistant. Eckert said. This month, Information Memories should be sampling products created with K-2-S, she added.

While Eckert is hopeful that drive manufacturers will take advantage of the process, K-2-S has yet to attract much attention. Officials at two potential client companies declined comment until they evaluate the product. Analyst Bob Katzive, who follows the disk drive market for Disk/Trend, Inc., said he did not know about the company's activities. He said Information Memories' field is crowded with more than 20 players worldwide.

#### Britton-Lee to use IBM drives

LOS GATOS, Calif. — Re-lational data base management system manufacturer Britton-Lee, Inc. plans to use IBM disk drives in its series of data base machines scheduled to be announced during this month's 1986 National Computer Conference.

Britton-Lee officials said that under a recent letter of intent, IBM's newest Winchester disk drives will be incorporated into Britton-Lee's Relational Server series. The RS300 series consists of data

base machines designed for office automation environ-ments and includes the RS350, which is scheduled for an NCC introduction.

"Since our products are now being heavily deployed in on-line transaction processing and corporate decision support applications, it is only natural for Britton-Lee to have the most reliable disk repository integrated into our data base ma-chines," according to Peter Story, Britton Lee's vicepresident for marketing.

#### Inmos unveils Transputer

From page 45

Transputer Evaluation Module 400 (ITEM 400). The ITEM 400 costs \$50,000 and reportedly allows evaluation of a 400-MIPS, 40-transputer system. It includes a power supply and card cage module, 10 IMS B003 boards incorpo-rating four IMS T414s per

board and the IMS D701 Transputer Development System, which operates on an IBM Personal Computer XT or AT and includes Inmos' Occam 2 compiler.
In addition, Inmos intro-

duced the IMS B006 Evalua-Board, priced from \$1,750, which allows evaluation of the IMS T212, and announced the IMS B007 Graphics Evaluation Board, which costs \$4,200 and allows evaluation of the T414's graphics capabilities.



#### Call this number for more 3X displays.



The next generation of 3X communications is here today.

Our new network cluster software allows three satellite IBM PC's to access a server PC equipped with the IDEAcomm 5251 emulation board. With IDEAcomm 5251, you can support 3180 and 5250 type terminals. And you also get windows to view display and printer sessions on one screen.

#### more Printers.



Emulate the widest range of IBM system printers, 5219, 5224, 5225, 5256, on the widest variety of letter quality and matrix PC printers.

#### and Remote



Dial up your System 3X from a remote site with IDEAcomm 5250/Remote. It's the only product to offer nine concurrent terminal and printer sessions for 5251 model 12 and 5294 emulation.

All our local and remote IDEA products support IBM file transfers, including PC Support/36 and Support/38.

#### **IDEAssociates**

IDEAssociates, Inc. 29 Dunham Road, Billerica, MA 01821



#### Far away in the South Pacific there's a computer market as big as America.

For most US computer companies export means Canada, Europe, S. E. Asia, the Middle East or Central and South America. But there is another huge market. Australia, as big as all forty-eight states, is a rapidly growing \$2 billion p.a. user of computer and communications technology.

The way to sell into Australia? Call Ausdata!

A multi-million dollar public company, Ausdata has a highly successful ten year history as a de-signer, manufacturer and international marketer and distributor of computer systems. And for added convenience, Ausdata has a well established marketing office in Santa Clara, California.

So if you're not selling into the lucrative Aus tralian market, (or if you're not selling enough) call Rod Hutchinson at Ausdata today on (408) <u>Ausdata.</u>

We're just beginning. United States: Ausdata/USA Ltd. 2326 Walsh Avenue. Building H. SANTA CLARA CA. 95051. Tel: (408) 748 9066 Australia: 175 Gibbes Street. CHATSWOOD. NSW 2067. Tel: (02) 406 5755

## Minis aid in firm's expansion

From page 45

drive the growth of information systems services, Powell says. But the Reality systems themselves have been critical in allowing the information systems to grow or change in response to the booming business. For example, in March, Richardson Electronics inked a pact with Varian Associates, Inc., a leading manufacturer of electron tubes, to distribute Varian's products.

Richardson agreed to provide all accounting for the joint venture. The company had to implement new kinds of general ledger generation and reporting. It also had to write a program to allow Varian customers to buy equipment with whatever currencies they wanted, since Varian already allowed its customers to do. Both of these complex systems, which are exception systems in that the non-Varian parts of the business do not use them, were put in place in about two months, according to Powall

"We exist in an almost utopian data base." Powell says. "One piece of data will exist in one place only." Users can reference that piece of data even though it is in another file because the data base is relational.

because the data base is relational.

In the past two years, the information systems department has grown from two to nine employees. The original two kept a highly structured accounting of everything that was done, and the company insists on that kind of work from the newer

programmers and analysts. "We say to the staff, "You must follow all of our conventions, otherwise you redo it,' " Powell says. "That has made it a lot easier for us to make massive change."

Almost all programming is done inhouse. The programmers work in an enhanced version of Basic called Data-Basic and use the built-in inquiry language English. "The Reality operating system forces you to be in and to operate in a relational data base, so everthing we have is data base oriented. We make major changes almost every week," Powell says. Reports generated with English generally take fewer than 15 minutes to design, he adds.

The company rapidly outgrew its first 32-user Reality system, which had been bought from one of the first companies acquired four years ago,

Powell says. "We quickly found out the potential for revenue generation on the system," he adds.

The company operated as two divisions when the first Reality system came on board. The two parts were inadvertently in competition with each other. They operated under different names and at different locations, but had identical products, availability and cost. Customers would get a price from Richardson's Chicago division then call the New York division and sometimes get a lower price.

"We were losing potential profits by not having information available to both divisions. So we put terminals in the other division and developed a system for inputting quotes and a ready-access system, which is really the heart of our system now," Powell

The ready-access system, written in-house and called Master Inquiry, gives fast access to customer, sales, quote, vendor, cost, inventory, stock, status and accounting information. The immediate result of its implementation was that the two divisions were able to set standard pricing and not out-bid each other for their customers' business.

As more acquisitions and bigger distribution agreements with other suppliers expanded Richardson, the company quickly went from the initial 128K-byte system to a newer model with 1M byte of main memory and 56 ports. That system was upgraded again to an M9208 with 6M bytes of memory, 1G byte of disk and 208 ports.

Another system, an M9250 with potential for more than 200 users, is working now as a backup developmental system. It will soon become an inquiry-only system as the company breaks up into two kinds of end users: updaters and inquiry-only.

Updaters are order entry, purchasing and inventory control people. Inquiry-only personnel look upcustomer history information, such as how much a customer was charged for a particular product the last time he ordered it. This dual system is a temporary solution to a need for a bigger computer.

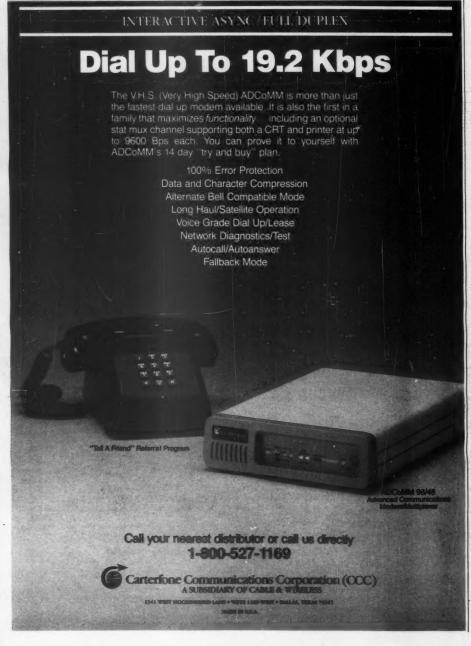
#### Promised first model of 400-user system

McDonnell Douglas has promised Richardson the first model of a new 400-user system by June 1, 1987, Powell says. When that happens, the two existing systems will be traded in and all work will be performed on the new one.

"As we have grown from about \$25 million a year four years ago to probably \$70 million this year, we are getting orders out in roughly the same length of time. We ship 98% of the orders — about 550 a day — the same day that we get them," Powell says.

One of the information system's main projects is to provide reporting, planning and budgeting information to the newly organized business structure. In the old days, everybody reported to Ed Richardson, who remains as chief executive officer. Now, a new president presides over seven vice-presidents, each of whom controls several operating groups.

"All of the VPs take an active role in their departments, and they take an active role in operating the computer to the extent that they need to in order to function in their jobs," Powell says. "So they all have terminals on their desks."



## THESE ARE YOUR ONLY TWO CHOICES FOR RUNNING IBM MAINFRAME APPLICATIONS AT THE DEPARTMENTAL LEVEL



BUY A \$300,000 IBM MAINFRAME FOR EVERY DEPARTMENT

OR BUY A \$60,000 IBM-COMPATIBLE CANAAN COMPUTE

The problem is familiar. DP/MIS budgets are already straining while PC users are demanding faster response time and greater access to mainframe data and resources. But Canaan Computer Corporation has a resourceful solution—in fact, the only solution short of installing IBM mainframes in each department.

Now, users can run and develop IBM mainframe applications on the industry's most cost-effective departmental computer. The Canaan DCS 5800" Departmental Computer lets up to 36 users run unmodified IBM 370 VM/CMS mainframe applications department by department, instead of on the mainframe.

It gives PC and terminal users fast response time and the full power of main-frame applications as well as database access.

#### COMPLETE COMPATIBILITY WITH YOUR EXISTING TERMINALS AND PCs

Cost effectiveness also means flexible connectivity. The DCS 5800 connects with the PCs and terminals you already have: IBM PCs, with or without IRMA" boards, 3178/3278 terminals, DEC VT 100s/VT 220s and many other ASCII terminals.

And, of course, it lets departmental users share printers, disk drives, software and information all within their own work groups.

#### THE CONVENIENCE OF RUMBING EXISTING APPLICATIONS AND THE POWER OF DEVELOPING NEW ONES

The DCS 5800 won't disrupt users' workstyles—they still run the same mainframe applications they're accustomed to, including IBM's Professional Office System (*PROFS*), fourth generation languages and decision support applications. Even IBM's *ISPF*, compilers, editors and debuggers.

Without requiring any additional training, MIS staffing or mainframe burden, the DCS 5800 also lets users develop and test <u>CICS</u> and <u>ISPF</u> applications in each department.

#### MULTIGATE DEPARTMENTALIZES MAINFRAME CAPABILITIES

Multigate, Canaan's family of communications software, integrates users, departments and MIS into a unified corporate information system, sharing information and applications.

Multigate PC "Plus" is an advanced PC communications software package that gives users the advantages of virtual disk capacity, pop-up menus and a complete PC application shell. Multigate 3274 BSC gives them additional transparent passthrough and logon with simultaneous sessions to VM and MVS mainframes. And Multigate LAN provides Ethernet communications at the departmental level among DCS 5800s and other minicomputers.

#### THE DCS 5800 DRIVES COSTS DOWN AND PRODUCTIVITY UP

Canaan's DCS 5800 provides immediate productivity with third party software we carefully test and certify for our growing library of commercial IBM 370 packages. Packages like FOCUS, RAMIS II," STRATA-GEM" and MODEL." All running on the DCS 5800 at a cost as low as 1/10th that of running them on a mainframe.

No other system is like the DCS 5800. It's the solution that users and DP/MIS can finally agree upon rather than compromise over.

The benefits are enormous, the cost is minimal.

Let us send you information on the complete story today. And you'll see why Canaan is the first choice of end users and DP/MIS alike to run departmental mainframe applications.

Write: Canaan Computer Corporation, 39 Lindeman Drive, Trumbull, CT 06611. Or call today: 1-800-382-4100. (In CT, call 203-372-8100.)

IBM is a regimered trademark of International Business Machines Corporation. IRMA is a trademark of Digital Communications Associates, Inc. RAMIS II is a registered trademark of Martin Marietta Corporation. STRATAGEM is a trademark of Integrated Planning, Inc. MODEL is a trademark of Lloyd Bush Inc.

Canaan Computer 39 Lindeman Driv Trumbull, CT 066 1-800-382-4100 (In CT, call 203-3'	ve 11	CW-6
	nore information on the partmental Computer. an call.	Canaan
Name		
Company		
Title		
Address		
City	State Zi	p
Phone		



The Departmental Computer Company

# Why the least expensive mainframe financial software may not be the best deal.



In mainframe financial software, as in anything else, you get what you pay for. Remember that when you read about rampant discounting and price slashing. At Data Design, we don't cut our prices to make a sale. That's because *after* the sale we don't plan to cut service and support, either. So, while getting a "bargain" may make your day, we'd prefer to make your next ten years.

We have a hard-earned reputation to uphold. A reputation built on 13 years of providing the highest quality systems and support in the mainframe industry. And nationally recognized independent software surveys confirm Data Design's unsurpassed record of user satisfaction—year after year.

We believe that the fast, trouble-free installation and responsive, knowledgeable support by management level people is worth what we charge for it. So do companies like Alcoa, Gerber, Pillsbury, Sherwin-Williams, Merrill Lynch, Bankers' Trust, Bristol-Myers, Federal Express, Litton, Lloyd's Bank, The New York Times Company, Owens-Corning, Royal Business Machines, Warner-Lambert and hundreds of other FORTUNE 1000 companies who choose Data Design over other major vendors.

Our customers know that it's important to keep the purchase price in perspective. The cost of a mainframe system is comprised of three elements:

1) The purchase price of the package; 2) The cost of installation and conversion and 3) The cost of daily system operation and maintenance. Of these three cost elements, the first is by far the smallest. What's the point of saving even \$50,000 on the purchase price if implementation and operations costs evenually add several hundred thousand dollars to the total? The trouble with cheap financial software is that you may never stop paying for it.

Financial software by Data Design. When you can't afford anything but the best.

GENERAL LEDGER
ACCOUNTS PAYABLE
PURCHASE ORDER CONTROL

FIXED ASSETS
CAPITAL PROJECT MANAGEMENT

Learn more about the best financial software available. Call Betty Fulton toll-free at 800-556-5511 today:

DATA DESIGN ASSOCIATES

Excellence in financial software. By design. 1279 Oakmead Parkway, Sunnyvale, CA 94086

#### **Product Spotlight**

Edited by Barbara Wierzbicki



#### INSIDE

New word processing vistas: Networking, portability and integration/54

User profile: Moving from dedicated systems to micros/60.

Comprehensive chart of micro-based word processing programs/61-68

## Word processing PCs taking over from dedicated systems

By SHAWN BRYAN

There really is some very good news for people looking for word processing software. With few exceptions, there are personal computer packages available ranging from economical programs that perform basic tasks to full-featured offerings that can run circles around the best dedicated word processing systems for half the price. You could say it is an embarrassment of riches.

say it is an embarrassment of riches.

The "no-frills" word processors — a misnomer because many no-frills packages have grown into very capable products — earn their keep by being relatively easy to use. "No frills" does not necessarily mean you have to give up functionality, just that the number of functions is more limited. A \$200-or-less word processor should include standard functions such as an 80-col. display, word wrap, centering, right and left justified margins, insert and delete, search and replace, moving blocks of text and automatic reformatting. Many popular no-frills packages — such as Software

Publishing Corp.'s PFS:Write, IBM's Writing Assistant and Lifetree Software, Inc.'s Volkswriter—provide users with all the features needed to perform basic word processing. If ease of use and a reasonable price tag are priorities, then the lost capability may well not be worth either the cost or the learning time involved in using a full-featured program.

At the other end of the spectrum are the full-functioned word processors. These programs, generally ranging from \$300 to \$700, offer just about every conceivable option (indexing, footnotes, end notes, math capabilities, table of contents generation, multiple columns and so on). Such full-featured contenders are replacing dedicated word processing systems at a fast clip. These products include

systems at a fast clip. These products include Multimate International Corp. (recently acquired by Ashton-Tate), Wordperfect from Wordperfect Corp., Wordstar 2000 from Micropro International Corp. and Microsoft Word from Microsoft Corp.

The relative flexibility and plummeting prices of PCs make them a natural choice when installing new word processing stations. Manufacturers of dedicated systems like the IBM Displaywriter—now discontinued—find demand for their sys-

Most good software can swap files with other good software. It may be better to offer a choice than to make a decision that satisfies no one.

Bryan is chief financial officer of Cabot Cooperative, a dairy manufacturing company in Cabot, VI. He is also president of Datatek, a consulting firm specializing in small computer systems design and implementation.

#### PCs overtaking dedicated word processing systems

tems vanishing as better and better software elevates PC word processing capabilities.

The strongest argument to be made for traditional systems is that they are dedicated to the sole task of word processing. To that end, their keyboards are customized for their single-purpose application. Keys are labeled, and often a single keystroke accomplishes what requires multiple keystroking in a micro-based package. Personal computers, on the other hand, can perform a number of tasks, in addition to word process ing, that are not possible on dedicated systems. PC users can now achieve equivalent word processing capability plus run thousands of other software applications programs including spreadsheet, data base management and business graphics. You don't get dedicated keys, but you don't get single-purpose hardware and software either.

There is, of course, a price to be paid for these feature-laden micro packages. Squeezing the capabilities of a dedicated system into a PC program means compressing all the functions into a keyboard that is, of necessity, generic. Manufacturers circumvent this prob-lem — albeit sometimes in a cumbersome way through the use of menus or multiple keystroke combinations. The IBM keyboard, for example, has 10 or 12 function keys that, coupled with the Alt, Shift and Ctrl keys, give you up to 48 possible keystrokes for calling

Dedicated word processing may still have its place, but it cannot be cost-effective in most situations. The \$12,000 price tag attached to a dedicated word process ing system is dizzying in comparison with that of a personal computer - fully equipped with printer, memory, high-resolution color monitor and so on - for

The price tag attached to a dedicated word processing system is dizzying in comparison with that of a personal computer.

Every quest for a good word processing package begins with a shopping list of required features and capabilities. The following universal questions should be answered before making any word processing purchase. These standard queries will trigger additional questions specific to your particular environment:

 Program support. Does the manual have a good tutorial with real examples? Does the tutorial

take you through the program in stages, or do you have to try to learn everything at once? Are the program examples realistic, and do they help you learn to use the program or do they teach you things you will never use? Does the manual have a good index and a good table of contents? Can you find specific information in a hurry, and is the information explained in an under-

Is there an on-line Help system? Does the on-line Help system offer specific help or vague generalizations? When all else fails, is there a program support facility at the manufacturer's company staffed by knowledgeable people? What are the program support options? Is there a toll-free telephone line? Is there free support or is the help by subscription? Do you get swift, accurate responses to your questions?

 Performance. How many keystrokes are required to accomplish common tasks like block moves and copies, search and replace and deletions? How many keystrokes does it take to scroll from one end of the document to the other? From the top to the bottom of the page? And from one end of a line to the other? Are cursor movement and screen scrolling swift or sluggish? Can you move from word to word, paragraph to para-graph and page to page with only one keystroke? How does the program mark text that is to be acted upon? Does the program support monochrome and graphic displays of text? Do you get a good representation on the screen of what your document will look like when it is printed? How many lines are available on the screen for editing text and how many are used by the program for information display?

Continued on next page

#### **Expert's Opinion**

#### New look to micro word processing: networking, porting and integration

By RONN T. MARSHAK

A s recently as two years ago, word pro-cessing on microcomputers was a nai-science. Functions and interfaces emulated the more mature cousins on dedicated word processing systems. During this era "Wang-like" equaled "good." But now things are

As the IBM Personal Computer became the de facto desktop workstation, micro-based word processing packages matured and rapid-ly overtook the sophistication of the dedicated

Products such as Multimate — previously marketed by Multimate International Corp. and now owned by Ashton-Tate — and Samna Corp.'s Samna Word were introduced, which boasted functionality that was comparable to Lanier Business Products, Inc.'s and Micom Systems, Inc.'s products but featuring flashier and friendlier interfaces.

Rashier and friendlier interfaces.

This trend has continued, and the current state of the art in word processing is to be found on microcomputer-based products.

Advocates of dedicated word processing still try to claim that micro word processing packages do not provide full functionality. This is not true.

Products such as Micropro International Corp. Wordstar 2000 and Multimate Advantage Professional Word Processor are as feature rich — if not more so — than Wang Laboratories, inc. 's Office information System or NBI, Inc.'s System 4000.

But the final argument comes from the dedicated wendors themselves. First NBI put its Documenter of the IBM PC. It took two years, but IBM finally followed suit, providing all the functionality of its top-of-the-line dedicated word processor, Displaywriter Text Pack 6, onto the IBM PC and compatibles. Data General Corp. and, more recently, Wang, have also joined the parade. Wang has gone so far as to offer its own keyboard for microbased word processing.

In fact, the death knell has begun to ring

In fact, the death knell has begun to ring for dedicated systems. The first faint tones were heard when the IBM PC-based Display write software was announced, and then in early April, IBM officially discontinued the Displayeriter live.

The company's strategic word processing oducts are Displaywrite 3 and the IBM Sysm/36 office software running Displaywrite

I anticipate that many vendors will follow suit, getting rid of boxes devoted exclusively to word processing while offering sophistical ed word processing on mini-based office sys-tems and PCs.

Having made my case for the validity and

Marshak, considered a leading authority on personal computer-based word processing, is associate editor and senior consultant with Patricia Seybold's Office Computing Group in Boston. She is the author of Word Processing Software for the IBM PC published by McGraw-Hill, Inc.

future of word processing on microcomputers, now let us look briefly at the state-of-the-art

There are few surprises left in word pro-cessing. Most of the features that users have long awaited now exist on a multitude of

For example, multiple-column text is available on Displaywrite 3, Samna Word III and the DOS version of Q-One from Quadratron Systems, Inc., not to mention dozens of other, less popular systems. Wordstar 2000, Multimate Advantage and Samna all offer automatic table of contents generation and sophisticated featuring.

cated footnoting.

Most micro-based packages provide limited sort and selection capabilities in form-letter merging. Some of these functions are sufficiently feature rich to merit the title "records processing."



Consultant Marshak

77

It has finally occurred to software developers that the basis for truly productive office computing is word processing.

What are the new vistas available to personal computer word processing? Three directions can be identified:

Networked versions. Multimate and Wordstar 2000 are just two of the many packages that have been enhanced to support PC networks and multiple users.

Porting software to different operating systems. Samma has recently ported Samma Word III to Unix while Quadratron's Q-One word processing package is now available on the state of the same and the same are same as the same are same are same as the same are same

• Integration with other applications. Micropro has equipped Wordstar 2000 + with a complete communications package, Starindex and Mailmerge, all of which were formerly separate packages. All functionality is available from the same menu and uses the same interface.

Similarly, Samna + comes complete with a spreadsheet application, and Microsoft recently announced Word Release 3, which includes an outline processor much like Living Videotext's Thinktank or Ashton-Tate's Frame-

Xywrite, a word processing program from Xyquest, Inc., does not come with any other application, but it allows you to run any application — random-access memory permit ation — random-access memory permi - from within the software on an inter-

Of the three directions, the third area is the most interesting. When word processing first came out, it was kept very separate from any sort of data processing function. And as new office functions were added to office systems, they, too, were kept separate from word processing. But now the lines of demarcation are

It has finally occurred to the software developers that most office applications are related and that the basis for truly productive office computing is word processing.

#### Continued from previous page

How many documents can you work on at once? Can you split the screen vertically? Horizontally? Both? How many keystrokes does it take to move from one document to another? How many keystrokes does it take to save a document? To recall one? How long does it take to save a document? How much memory does the program need? How much can it use? Can you customize your installation to take advantage of your hardware? Is there an unerase feature? Can you lose text accidentally? How many chances do you have to change your mind before text is gone forever? Are you warned when an action is irretrievable?

• Printing. How many printers are supported? How easy is it to install printers? Is there a customization program that allows you to install printers not now supported? How many printers can be installed at once? How are special printing characteristics shown? How are they entered? Can you print parts of the document instead of the whole thing? Can you print in the foreground and background — print one document while working on another? Can you print superscripts, subscripts, headers, footers, tables of contents, indexes? Will the program print columns of text? How long a page can you print? How wide?

• Import/export capability. What kinds of files can you import and export? How difficult is importing and exporting? Can it be done from within the word processor or do you have for run a special program?

■ Special features. Is there a dictionary or spelling checker built in?
Does it work on-line as well as in batch mode? Is there a style checker or thesaurus? Is there automatic hyphenation — can you turn it off? Is there an automatic file save or back-up procedure? Is there a math capability? Can you merge several files? Is there a mail-merge feature? Is there a macro feature? Can you use boiler plate easily? Can you easily reformat documents? Can you import graphs into your text? Is there a line drawing feature?

• Trade-offs. Every program is a compromise. How do trade-offs between speed and ease of use, for example, affect your ability to get, the work done? How well will the program hold up in the long hau!? Will the menus get in the way? Will the lack of menus put people off? Will a program's lack of speed or difficulty of use become a problem? Will copy protection cause problems with a hard-disk system?

he manager trying to decide how to install word processing in his office faces a bewildering array of software choices. Perhaps the best known name in PC word processing is still Micropro's Wordstar. While Wordstar has seen better days, there are still countless users of this venerable product. Wordstar 2000 is a menu-driven, more friendly version but other products beat the program to the punch, most notably in the areas of speed and flexibility.

in the areas of speed and flexibility. The first product to displace Wordstar was Ashton-Tate's Multimate. Multimate emulates the popular Wang Laboratories, Inc. dedicated word processing systems. In fact, it emulates Wang so well that Wang finally decided the lost market share

77

The release of some spectacularly good integrated software threatens to make serious inroads into the stand-alone word processing software market.

was worth fighting for. They have released Wang Word Processing for the IBM PC, but it suffers when compared with the richer and better documented Multimate system, a product cloned from the same source. The Wang solution, however, offers connectivity with the vendor's VS and Alliance systems plus communications devices that work with other manufacturers' PCs. Thus Wang Word Processing for the IBM PC can work as part of a Wang integrated

office solution while Multimate is more of a stand-alone selection.

The Wang and Multimate systems both come with special keyboards. They move functions to single keys, eliminating the Alt and Ctrl key sequences used on standard PC keyboards. The Wang keyboard is mandatory, the Multimate keyboard is optional. The software-keyboard combination is effective for dedicated word processing, but some software takes control of the keyboard

and assigns tasks to special key sequences. Such software may not work as well on these fancy keyboards.

The keyboards also offer a completely different touch. Touch is a matter of taste, but if the computer is to be used mostly for word processing, it is foolish to ignore the comments of the staff using the machine. Make sure you can live with them after the purchase. A lousy keyboard can make life miserable for the typist and the boss.

Both Multimate and Wang are page-oriented systems. This means they save each page as a separate file on the disk. The benefit of this method is that your word processing documents are backed up on disk page by page. If the power suddenly

Continued on next page



Continued from previous page

goes off, only the current page being edited is apt to be lost. The disadvantage is that there can be both page and document length limits that could prove restrictive if you tend to write novels instead of memos to your staff. The other drawback often cited for page-oriented word processors is that they are slow. That was true with floppy disks, but most computer systems today have sprouted hard disks and thus have eliminated the speed problem.

Memory-based systems such as Wordperfect keep the entire document - or as much of it as possible in memory. The advantage is that the entire document is in randomaccess memory (RAM), the fastest part of your computer. The disadvantage is that RAM is temporary. If the power goes off and you haven't recently saved your work, you may find everything has evaporated. Most high-performance memorybased word processing programs offer an automatic backup option that will occasionally call a halt to operations, while it puts your work into a temporary file on disk. If the power goes off, the latest backup is available in that temporary file.

If you are purchasing a word processing program for a marketing department, you will undoubtedly find that graphics capabilities are important. There are several ways to approach this problem, depending upon your company organization. Large companies may have offset presses that can take information directly from a PC, provided it is properly formatted with the typesetting codes.

But even big firms can benefit from a single Apple Computer, Inc. Macintosh and laser printer. While still struggling to gain a solid reputation for number crunching with the gray-pinstripe-suit set, this machine rivals any other system for doing your own graphic arts work. Painting, graphs, charts and so on take on new meaning with a Macintosh and a laser printer. A significant problem with the Mac, however, is that connectivity with your host system may not be available. While Apple has promised connectivity improvement, the Mac is still not as well supported as other systems in this respect.

The IBM and compatible crowd is catching on, and Microsoft Word now offers some of the same graphics capability found on the Mac. Other products are also available that work with word processors to add a graphics touch, like Ashton-Tate's Graphlink, available with Multimate.

nother breed of software — the integrated program — further complicates word processing selection. The release of some spectacularly good integrated software threatens to make serious inroads into the stand-alone word processing software market. Integrated software — a term once synonymous with Lotus Devlopment Corp.'s 1-2-3 — now means everything from spreadsheet-based programs to fully independent software modules running under a common umbrella.

Enable from the Software Group and The Smart System from Innovative Software, Inc. are two that come immediately to mind. Each of these programs has a full-blown, built-in word processor. Enable uses an inte77

The beauty of integrated software is that it is gracefully linked with other software applications— spreadsheet, data base management, graphics and communications— that all work harmoniously together.

grated software approach but manages to keep stand-alone power alive. The Smart System uses the separate program in a shell approach. Both products have 99% of the functionality of the dedicated systems, including spell checking, indexing, outlining and so on. The beauty of such software is that it is gracefully linked with other software applica-

tions — spreadsheet, data base management, graphics and communications — that all work harmoniously together.

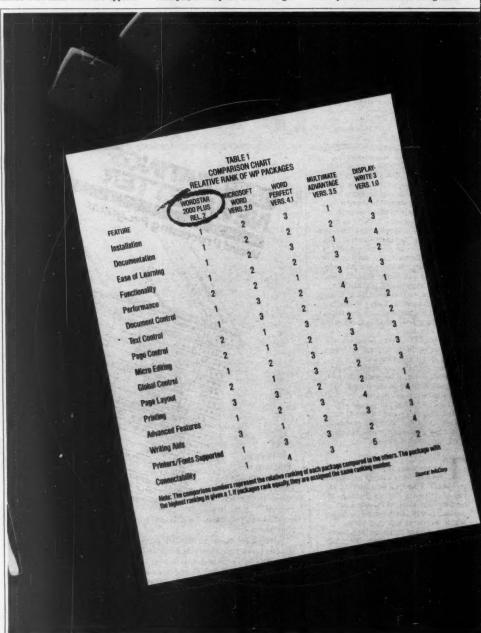
Both Enable and The Smart System allow you to move from section to section like a skater on ice, flowing effortlessly from spreadsheet to data base to word processing, for example, to complete a mail-merge

letter. Graphs can also be moved into your text and printed as part of your written message.

Another heavyweight that merits consideration in this group is Framework II, a much-improved version of the Framework program introduced by Ashton-Tate. Word processing in Framework II isn't quite as fancy as in the above programs, but the product includes some valuable features like automatic conversion of text fractions to decimal numbers when they are transferred to a spread-sheet.

If word processing is just one of many required capabilities on your PC systems, you may find reasonable alternatives in the new breed of integrated programs now available.

Last, if you have multiple personal computers in a network being used



for a number of different chores. these products all sport — or claim to have in the works — versions that will run on networks. The only one have actually seen working is The Smart System, LAN Version from Innovative Software.

hird-party selections dominate the market with the big manufacturers taking distant second and third places. The choice is further complicated by various host hardware installations that may not be conducive to shared resources with PCs. Because word processing often dictates sharing of information, not only with people but with other soft-ware and hardware, it is important to consider all the options when trying to make the best decision.

The first consideration, existing hardware, may be a moot point in some instances. In a Wang-powered office, for example, it may well make sense to stick with Wang-compatible word processing if you are moving to PCs. New communications release from Wang make it possible to tie microcomputers from many manufacturers to a Wang host, and the company's recently released word processing program, Wang Word Processing for the IBM PC works as part of its total office system.

The Wang hardware devices include the Wang Local Office Connection and the Wang Remote Office Connection. The Local Office Connection allows an IBM Personal Com-puter or compatible to function as a workstation on a Wang VS host computer system. This hardware attachment allows connections to be made within about 2,000 feet of the host. It retails for \$1.895 and includes the communications hardware and software, the Wang replacement keyboard and Wang Word Processing for the IBM PC.

The Remote Office Connection allows connection to a VS host system over point-to-point or multipoint synchronous links at up to 9.6K bit/ sec. This hardware-software system extends the distances over which you can connect to the host and allows for file transfer between the host and a PC. The PC will also be able to use some of the facilities available on the host, like Wang Office Information System. This option includes a Wang replacement keyboard, word processing software, telecommunications card, diagnostic

software, Wang Networking Software and an RS-232 cable for \$1,200.

The same holds true in an IBMpowered office, where most likely Displaywrite on a host system holds a commanding lead over other options. Even if Displaywrite is not the best micro word processing program, familiarity with its style may make the transition to PC word processing simpler. If you stick with a known entity, people will be less threatened than if they are faced with learning to use an entirely new program.

Even within Wang and IBM environments, there exist many personal computer options because most of the better third-party word proces ing programs now offer conversion capability. If you are using word processing on your mini or mainframe, your consideration is usually fairly simple: Find a PC software product that includes file conversion utilities for the brand of large computer system and software you are

77

Get copies of the software you want to consider and set up some demo rooms. Let the people who will have to live with the purchase use the product.

Multimate, Wordperfect and others include file transfer capabilities for many of the common formats now in use such as IBM's Document Content Architecture and Document Composition Facility. Some even offer custom transfer utilities for a fee.

A more mundane hardware consideration is the display monitor used on PC-based word processing systems. There are essentially three options. You can purchase a graphics display card and graphics monitor in either high or low resolution. Highresolution cards are fairly new to the marketplace, so make sure the software you are considering supports the display device. Lower resolution devices are almost universally supported but can be troublesome, because the resolution is not particularly good.

You will not find many programs that display text on the screen as it will actually appear on paper when using the lower resolution graphics adapters. Various tricks, like reverse video and different colors on a color display, are used to denote what the text will look like when printed.

Another option is to purchase a higher resolution monochrome display device that presents most text as it will appear. Unfortunately, these devices do not display graphs on the monitor, so you may be stuck if you use your machine to create graphic displays.

The third option is to purchase a monochrome display and a monochrome graphics card. These cards allow display of both graphs and high-resolution text. You can also purchase a combination of the above in a single board. Some hardware offers this capacity built in. If yours does not, these devices, such as the

Continued on next page

# JINK YOU

Introducing WordStar\* 2000 Plus Release 2, the new and improved software that topped InfoCorp's chart of word processing packages.

We could make all kinds of claims about our new WordStar 2000 Plus Release 2.

About its commonsense commands. Tutorials for easy training. Direct Lotus® file input Extensive printer support. DCA connectivity. LANs and site licensing options.

That would be easy to do.

But we decided to let the experts do the talking.

In a comparative report—the report containing the chart to the left-Robert Lefkowits of InfoCorp said:



"W5 2000+ emerges as a clear winner in overall applicability. InfoCorp believes WS 2000+ would appeal to the largest number and widest variety of users. Its layered functionality, ease of learning, and excellent

communications features make it ideal for corporate users, ranging from secretaries to clerks to managers to executives."

And, after reviewing WordStar 2000 Plus Release 2 alongside MultiMate™ Advantage™ and IBM®'s

"WordStar 2000 is our favorite-for ease of learning, ease of use ... and for well-conceived and helpful documentation."

Jim Chapman concluded:

Now we don't expect you to take these opinions as gospel.

DisplayWrite® 3, International Data Corporation's

Because when it comes to knowing your company's word processing needs, you're the expert who really matters.

So evaluate our product yourself.

See your local MicroPro dealer today. Or call 800-227-6703 (800-632-7979 in California) for the dealer nearest you. Put WordStar 2000 Plus Release 2 to the test and see how it measures up to the advance reviews.

We believe it'll be time well spent. For you and your company.

If you'd like the complete InfoCorp and IDC reports, we'll be happy to send them to you. Just fill out the coupon below and mail it to or call 800-443-0100 x. 547.

WORDSTAR



Lot and the De Charles | 1 are commend to the set of Lots Development Concerns and Ele Concerns a Research to the set of Lots Development Concerns and Ele Concerns a Research Concerns and Ele Concerns a Research Concerns and Ele Concerns a Research Concerns and Ele Concerns a Research

Continued from previous page Hercules Graphics Card from

Hercules Computer Technology, Inc. are available from third-party manufacturers.

My recommendation for all serious word processing is monochrome, either amber or green. The higher resolution makes long hours at the screen bearable. If graphics are a real concern, the Hercules standard is almost universal, and excellent results can be achieved by combin77

Be realistic and remember that every software purchase is a compromise. The goal is to hit as close to the bull's-eye as possible.

ing a monochrome monitor and a Hercules card. It costs a little more and means a third-party board for your systems, but the money is well spent. In terms of software, you might look at either the Apple Macintosh or an IBM Personal Computer or compatible running the Windows and Word programs from Microsoft. After establishing the desired micro configuration, you have to think about how the PC will work as part of the larger whole. In offices where a host computer does the heavy work, you will want to be sure you can tie the PC to the host system.

Getting information to your PC from the host for processing can be accomplished through asynchronous file transfer with a modem and dial-up port - the cheapest and slowest method
— or by direct connection to your mini or mainframe. Many devices are now on the market that allow file transfer through terminal emulation. For example, AST Research, Inc. makes an IBM 3270 emulation board and software that permits connection from a PC to an IBM mainframe. Using this software and hardware makes the PC look like a 3270 dumb terminal to the host while retaining all the PC functionality on the other end.

In this instance, the PC appears to be a device the host system recognizes as a legal terminal. In many cases, the software supplied with such direct-connect hardware reconfigures the PC keyboard to take advan tage of the many specialized keys available on more sophisticated terminal display stations. If you have such a machine, file transfer to your word processor is simple. Of course, you can still use the PC as a terminal on the host system to do word processing.

et's say your office regularly uses an IBM 3081 as its host system — a fairly large computer requiring 3270 emulation. The office does a lot of production typing of a routine nature, drawing upon the name and address files in the mainframe for mass mailings to customers. The first problem is simple. Connectivity with the host is simplified by any one of several 3270 emula-tion products. You now have a PC that can talk to the host and get data from it. Since the typing is production work with a lot of repetition, you will want a word processing package that is strong on handling boiler-plate as well as mail-merge activity. You will also want a program with sound conversion capabilities in order to be able to bring the names and addresses from the mainframe into the word processor. Multimate and Wordperfect are strong in both areas.

Once the information is on your PC, you can use the conversion utility to turn it into files understood by your PC word processor. The advantage of using these protocols is that spacing, tabs and other formatting information is not lost in the transfer process as it is in a straight ASCII download.

The toughest part of any evaluation process is devis-

Continued on page 60

# Why CA is the software to have when you're having more than one.

It's unfair.

No matter how many copies of a top micro software program you buy for your corporation, you're forced to pay a price.

A high price. For every copy.

Well, now you don't have to take it anymore. Introducing the Computer Associates Corporate Licensing Program.

Now you can provide your company with the strongest line of micro software in the world. From a single wendor

Programs like

The more copies you buy, the more you save.

the more you save. SuperCalc® 3
Release 2 integrated spreadsheet, database, and graphics package.
SuperProject® Plus, the powerful resource management software package. EasyBusiness
Systems® integrated accounting software. And

EasyWriter II® for word

processing.

So you can standardize your company's micro software. From 25 copies to an unlimited license.

And along with each Corporate
License, we also offer the most comprehensive support and maintenance

program in the industry. And our reproducible master disk gives you total control over software distribution in your company.

The Corporate Licensing
Program includes free product upgrades and enhancements. Expert technical support.
Optional seminars, product training.



We also include the strongest support program in the industry.

reference materials.

Corporate Licensing, Another business solution from Computer Associates. The world's most experienced independent business software maker. With a client list alone that includes over 80% of the Fortune 1000.

For more information on our Corporate Licensing program, call Pat Williams at 1-800-227-0112 (in CA, call 1-800-228-1090).

Because our Corporate Licensing program is an idea that makes more than dollars for your company.

It makes sense.





Computer Associatis jurdictivity notiveurs: SuperCale\*3; Intense 2; SuperCale\*3; SuperProject\*\*, Essy Weiser IIP System; EssyPhaner\*\*; EssyPha

## **MANTIS** 1981

"Cincom application tool slashes development time." Source: Computerworld, January 19, 1981

"MANTIS has paid for itself many times over in programmer productivity and end-user satisfaction. Source: Jay Lazarre, V.P. for MIS, Pellerin Milnor

"Performs like COBOL, with the productivity of a true 4GL - and used for all new, on-line development." Source: Tony Liberoni, Manager of Operations and Systems, PPG Industries Chemical Group

"100% of our new on-line development is in MANTIS." Source: Luther Perry, D.P. Director, Santa Cruz County, CA

"MANTIS is the international on-line application development standard for General Foods." Source: Fred Lambrou, International Director of Information Services, General Foods International

## MANTIS 19 The Best Just Got Better.

Proven in over 2,000 user sites, MANTIS, from Cincom, is the premiere fourth generation application development system.

And, now the best is even better. Our major new release of MANTIS gives you even greater performance and productivity.

With MANTIS, you can prototype, refine, test, and release an application for production in a single, interactive session. Compile-free MANTIS applications are fast, and easy to develop and maintain. And MANTIS provides such high performance that many users make it their standard for all on-line applications.

MANTIS portability lets you move applications - without change - from one operating environment to another. From VSE to MVS. From CICS to IMS/DC. Even from one hardware system to another, including IBM,® DEC™ VAX™ Wang VS,® NCR® VRX and others. And MANTIS provides support for multiple data structures, such as VSAM, DL/1, SQL/DS, SUPRA and others.

To see just how much better MANTIS really is, compare it to any other system you're using or evaluating. For a demonstration or more information, call the toll-free number below. In Ohio, call 513-661-6000. In Canada, 416-279-4220.

1-800-543-3010.

World Headquarters • 2300 Montana Avenue • Cincinnati, Ohio 45211

g VS is a regis Fang Laboratories, Inc.

Now Available

For IMS DE USERS

#### University converts to micros

By DAN SWEARINGEN

ounded in 1896, the Universi-ty of New Mexico (UNM) is the largest of the state's five pub-licly funded universities, with 24,000 students on five campuses and 8,000 faculty and support

From the day IBM's Magnetic Tape/Selectric Typewriter was first announced in the mid-1960s, the university has used a wide variety of word processing equipment.
Today, UNM has more than 150 dedicated word processing systems from a variety of vendors including IBM, Wang Laboratories, Inc. and

Current equipment, tight budgets and an investment in data and programs on existing systems ans that integration approaches must involve the use of equipment already in place. The effort to connect and share data between a wide variety of equipment has been on-going at the University of New Mexico's main campus in Albuquer-

que for the past several years.
In the late '70s, UNM decided to connect its several thousand computer terminals, microcomputers and dedicated word processors to six Digital Equipment Corp. VAXs and an IBM 3081 Model D with a single network. The goal was to link administrative and academic terminals to all major university computers; to permit document in-terchange, messaging and calendar-ing; and to allow easy data file

To that end, dedicated systems are being gradually phased out at UNM and replaced by microcomput-ers. Conversion is being aided by

Swearingen is an office automa-tion consultant based in Albuquerque, N.M.

IBM's Document Content Architecture, which allows documents to be moved from dedicated system to microcomputer with formatting commands intact. This move from dedicated systems to "open" micro-computer systems echoes a recent International Data Corp. report on text processing, word processing and electronic typewriters, which stated, "The idea of multifunctionality continues to be the most im-portant concept in the word prosing market place

To lay the groundwork, UNM chose Ethernet. Installation of this broadband network is nearly complete across the 600-acre main campus, allowing terminals easy access pus, anowing terminate easy access to the DEC systems, which are used for academic computing, and to the IBM mainframe, which serves ad-ministrative needs. Microcomputers use Polygon Associates, Inc.'s Poly-TRM software for emulation of the DEC VT100 when accessing the network.

To deal with its long-term objectives, UNM developed a purchase and support policy to provide a guarantee to user departments that equipment purchased would fit into the long-term plans of the university. The policy provides some con-trol by limiting purchases to a ros-ter of products that have been pretested by the Microcomputer

Support Group for compatibility.
The Microcomputer Support
Group provides a variety of services, including configuring and pricing systems, a user hot line, on-site support and application devel-

opment tips and user training.
For UNM, the rest of this decade will be one of consolidation and conversion to microcomputers with open architectures. Such a move will help prevent being locked into a specific integration concept and thus lengthen the useful lifetime of the university's integrated comput-

#### Continued from page 58

ing a method of judging what your needs are and then selecting the product best suited to addressing those needs.

A survey of existing chores is a logical first step. What is it people are doing, and how can that be automated? A simple and inexpensive word processing program may suffice for many routine typing chores. The larger programs have more power and flexibility but require more hand-holding. Overkill can be as dangerous as underkill, especially to a new user. Be certain you have accurately assessed the needs of the actual users of the system.

Also list any hardware constraints. This allows weeding out of programs that cannot pass muster with your host system or with your existing personal computers.

Now comes the time-consuming part. Get copies of the software you want to consider and set up some demo rooms. Let the people who will have to live with the purchase use the product. Get their feedback. It is an old sales technique, but if the user thinks he has a part in making the decision, he'll be happier with the purchase

Be realistic and remember that every software purchase is a compromise. The goal is to hit as close to the bull's-eye as possible. Don't be afraid to standardize on more than one system. Most good software can swap files with other good software. It may be better to offer a choice than to make a decision that

While the users are evaluating the software, you should be evaluating the vendor. You can buy software a number of ways - from the manufacturer, from a local dealer, from a mail-order house. Evaluate prices and support from your chosen method and compare with other vendors.

nce the decision is made and the software purchased, follow up with support if possible. Help install and start tutorial sessions. Some of the greatest productivity gains can be made in such repetitive tasks as word processing, where the same document is used over and over. Those gains may be lost forever if the introduction to the new machine and software is a painful one.

Also explore the workstation vs. the dedicated PC. Some personal computers are better shared, while others may be better left dedicated to a single, high-volume user. If the word processor is at someone's desk but part of a shared installation, that person will have to be displaced every time someone wants to use the machine. Soon the word processor will be gathering dust from a lack of use. Weigh the cost of two machines vs. the cost of shared resources.

Finally, and most important, continue to listen to the people using the programs. Stay current and pay attention to upgrades. Most reputable software firms will notify you of upgrades, and they will have a reasonable fee for the service.

## Start your job on a PC... Finish it on a VAX. V-DRIVE

V-DRIVE is a unique PC to VAX link. V-DRIVE creates a network for your PC users, using the VAX as a sophisticated file server. Advantages: PC information is stored on VAX hard disks and is automatically backed up with the VAX. PC users can move between PC-DOS applications and VAX mail or VMS with a single key stroke. VT 220 terminal emulation is built-in. PC data can be shared or private. Read-only or read-write. No new commands to learn. Easy. Your VAX or MicroVAX™ becomes a superb file server, and your PC users are integrated neatly into the VAX environment.

Plus, if you have VMI's BRIDGE System, terminal users can run the same PC software, sharing the same data as the users with V-DRIVE. And the low cost will impress you.





Word processing software that easily lets your IBM PCs become part of your Digital integrated office system.

The problem with having different types of pensonal computers in one office is that you often wind up repeating yourself.

Retyping, Reformating, Retrieving lost information, But with Digital's WFP-PULS PC "offware, you can easily move and revise documents between your IRM PCs XTs."

DECTRACES and WXP" or MicroVAX" host ware, you can easily move and revise documents between your IRM PCs XTs."

DECTRACES and WXP" or MicroVAX" host of the problem of the

to work together. Find out how to get your competitive advantage now. Call 1-800-343-4040, extension 627, or write. Digital Equipment Corporation, Media Response Manager, CR01-2/M94, 200 Baker Avenue, Concord, MA 0742-2190.

digital

© Digital Equipment Corporation, 1986 Digital, the Digital Dign, WPS-PLLS PC, DECreate, VAX, and MicroVAX are tra-of Digital Equipment Corporation. IBM, IBM PC, and IBM XT are registered trademarks of Interpretational Business Ma-

#### PC WORD PROCESSING SOFTWARE

		Se Campa	1	11			18	11	11	18	Price
dor/Product * rus Corp.	256K	Yes	Yes	No	No	No	No	Yes	Yes	Yes	\$99.95
ite G5 200 S.W. Nimbus Ave. rtland, Ore. 97223											
l: Typist											2
nalytical Software, inc. 0939 McCree Road allas, Texas 75238	128K	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	\$150
Executive Assistant											
Ann Arbor Software 107 N. Main St. Ann Arbor, Mich. 48104	256K	Yes	No	No	No	No	No	No	No	Yes	\$29.95
Textra 3.1A			-								
Arrays, Inc. 6711 Vaijeen Ave. Van Nuys, Callf. 91406	256K	Yes	No	No	No	No	Yes	No	Yes	Yes	\$149.95
Windoword		1000					100				E. COR.
Beaman Porter, Inc. 417 Haistead Ave. Harrison, N.Y. 10528	128K	Yes	Optional	Yes	Optional	Yes	Yes	Yes	Yes	Yes	\$399
Powertext 2.1											
Businessoft Corp. Suite M-4	256K	Yes	Yes	Yes .	No	Yes	No	No	Yes	Yes	\$189
703 Giddings Ave. Annapolis, Md. 21401											-
Mind Reader Version 2.0					-					1	
Chang Laboratories, Inc. 5300 Stevens Creek Blvd. San Jose, Calif. 95129	128K	No	No	No	No	No	No	No	No	Yes	\$295
Memoplan		*									
CMI Software 1395 Main St. Weitham, Mass. 02154	256K	Yes	Optional	No	Yes	Yes	Yes	No	Yes	Yes	\$595
Techwriter											
Command Software Corp. Suite 1 1360 N. Main St. Walnut Creek, Calif. 94596	256K	Yes	Yes	No	Ýes	Yes	Yes	Yes	Yes	Yes	\$150
Commandwriter II								-			
Computer Associates International, Inc. 2195 Fortune Drive San Jose, Calif. 95131	128K	Yes	Yes	Yes	No	No	No	No	Yes	Yes	\$195
Easywriter I											
Computer Associates	192K	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	\$395
Easywriter II System		FIRST ST			V	V	Van	Vac	Voc	Yes	\$199
CYMA/McGraw-Hill 2160 E. Brown Road Mesa, Ariz. 85203	256K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Tes	\$133
Final Draft											******
DAC Software, Inc. Suite 1108 4801 Spring Valley Road Dallas, Texas 75244	256K	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	\$49.95
DAC-Easy Word							7				
Emerging Technology Consultants, Inc. 4760 Walnut St. Boulder, Colo. 80301	256K	No	Yes	No	Yes	Yes	' Yes	Yes	Yes	Yes	\$490
The Professional Writer's Package								-			
Friendiysoft, Inc. 3638 W. Ploneer Pkwy. Arlington, Texas 76013	128K	Yes	Yes	No	No	No	No	No	No	No	\$89.95
Friendly Writer		4									

	£ 2.2 2	Comen.	No.	25	**	8	1	11	11	8.8	
endor/Product		A. T.	1	66	A Party of the Par	34	34		18	88	Price
amma Productions, Inc. uite 102 17 10th St.	320K	No	No	No	No	No	No	No	No	No	\$184
anta Monica, Calif. 90403 furtilingual Scribe											u oka, a uga Sa Sas
landic Software, Inc. 00 Patterson Plank Road aristadt, N.J. 07072	128K	Yes	No	No :	No	Yes	No	No	Yes	Yes	\$129
Word Result								-			WEST.
landle Technologies, inc. Julte 900 500 San Felipe Jouston, Texas 77063	512K	Yes	Yes	No	No	No	Yes	No	Yes	Yes	\$395
Handle Write/Spell										PU 912 17	
Newlett-Packard Co. Contact local HP sales office	640K	Yes	No	No	No	No	Yes	Yes	No	Yes	\$295
Advancewrite I											4000
Hewlett-Packard  Advancewrite II	640K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	\$550
Hewlett-Packard	640K	^ Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	\$695
Advancewrite III											
HFK Software, Inc. Old Danbury Road Danbury, N.H. 03230	128K	No	No	No	No	No	No	No	Yes	Yes	\$149
Professional Qwerty						THE FOR					The Home Gran
Contact local marketing representative	128K	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	\$165
Writing Assistant	256K	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	\$450
Displaywrite 3 Version 1.1	250N	163	103	103	1						
Image Processing Systems 4414 Regent St. Madison, Wis. 53705	256K	No	Yes	No	No	Yes	Yes	No	Yes	Yes	\$250-\$475
Proofwriter 2.33						1				September 1	STREET PROPERTY.
Infonetics, Inc. 13 Woodland Ave. Verona, N.J. 07044	128K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	\$495
Galen's Scribe											7
Innovative Seftware, Inc. Suite 380 9300 W. 110th St. Overland Park, Kan. 66210	256K	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	\$395
Smart Word Processor										1000	
Leading Edge Products, Imc. 225 Turnpike St. Canton, Mass. 02021	256K	Yes	Yes	No	No	Yes	No	- No	Yes	Yes	\$100-\$19
Leading Edge Word Processing											14
Lexitroxics, Inc. Suite 14 101 E. Holly Ave. Sterling, Va. 22170	256K	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes	\$595
Lexitype											Land on
Lifetree Software, Inc. Suite 315 411 Pacific St. Monterey, Calif. 93940	256K	Yes	Yes	·No	No	Yes	Yes	No	Yes	Yes	\$295
Volkswriter Deluxe 3	1001	Ver	Ven	Yes	No	No	No	No	Yes	. Yes	\$169.95
7852 Big Bend Bivd. St. Louis, Mo. 63119	128K	Yes	Yes	res	No	NO.					7105.35 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Simply Perfect	100**	V	Pl-	No.	No	Van	No	Yes	No	Yes	\$199.95
P O. Box 93 Belmont, Calif. 94002	128K	Yes	No	No	No	Yes	No	165	NO	165	¥199.93

## Corporate Maneuver.

In the high-pressure corporate environment, every move counts. It's no wonder, then, that many corporate PC users are reaching for WordPerfect for powerful business word processing.

#### Reaching the top.

WordPerfect is now the best-selling word processor for the IBM PC, according to market research firm InfoCorp. And customers like Ford, Chrysler and TRW are leading the way.

#### Meeting user needs.

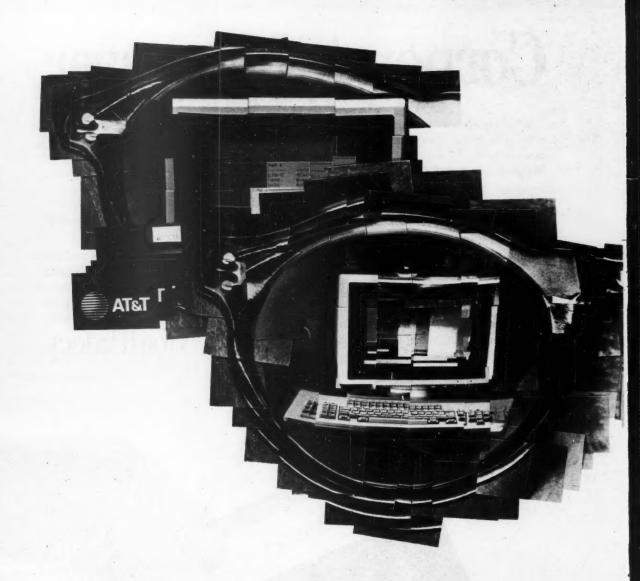
But WordPerfect's climb to the top was no overnight success story. For the past three years, user feedback has been applied to each new version of WordPerfect, pushing it closer and closer to perfection. The result is WordPerfect 4.1, a word processor with unsurpassed business features for the IBM PC and compatibles. Features like an elegant thesaurus, a 115,000-word spelling dictionary, math capabilities, columns displayed side-by-side on screen, windows, line drawing, paragraph numbering, and extensive printer support.

#### Make your move.

There is a word processor that is as productive for executives as it is for secretaries. WordPerfect 4.1. It's the consummate corporate maneuver. For more information, call or write WordPerfect Corp., 288 West Center St., Orem, Utah 84057, (801) 227-4000.

WordPerfect

Hold Placesing Dos



#### TAKE A LONG HARD LOOK AT THE OT

Consider the AT&T 6500 Multifunction Communication System. For the first time, you have a real choice in 3270 Systems. From a company every bit as solid as Big Blue.

Which means, for a start, that complete 3270 compatibility in both SNA/SDLC and BSC protocols is a given.

#### A HOST OF HOSTS.

The AT&T 6500 will tie together data and applications from up to three synchronous and 16 asynchronous hosts. Not to mention allowing PCs to work as terminals.

What's more, you can switch back and forth between synchronous and asynchronous hosts with the touch of a single keystroke.

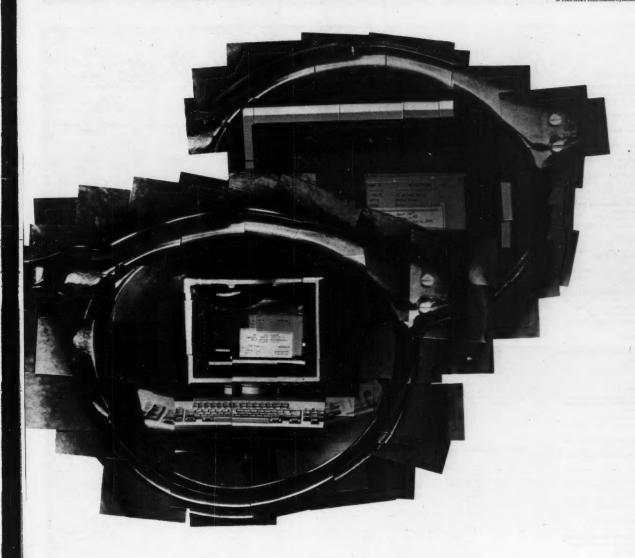
#### WINDOWS WORTH LOOKING INTO.

The 6500 lets you create up to four windows at the same time—into both synchronous and asynchronous hosts—and freely pass information among various databases.

For example, an inside salesperson taking an order could access: the customer's credit status in one host; relevant inventory information from another host at a completely different location; and the order form to fulfill the request from yet another host at another location.

All, on a single screen.

That kind of power means big productivity gains with no outlay for costly systems and applications development.



#### HER THREE INITIALS IN THE 3270 WORLD.

#### PEACE OF MIND.

The 6500 incorporates AT&T's experience with three previous generations of 3270 equipment. As well as the kind of service that smaller companies just can't provide.

And we make the pieces fit. Modular architecture assures you of smooth system evolution: upgrading doesn't even require a new communications controller, and you can easily reconfigure your system with almost no disruption.

That's what you'd expect from the company that makes "The Computers With The Future Built In."

#### MORE PEACE OF MIND.

Even with performance that matches or sur-

passes comparable IBM\*equipment, the AT&T 6500 looks a lot better on your balance sheet.

So before you decide on 3270 compatibles, call on your AT&T Account Executive, or simply dial 1800 247-1212.

We'll make sure you get a lot more to look at.



	1111	The Contrary	and the same of th	11	11	1	11	11	11	18	
ander/Product are Software, Inc. 50 Sheridan Ave. slo Alto, Calif. 94306	256K	Yes	Yes	Yes	No	No	Yes	No	No	Yes	\$195
Abremarc Author				Vee	Yes	Yes	Yes	Yes	Yes	Yes	\$495
Rarc Softwars  Wordmarc Composer	512K	Yes	Yes	Yes	105	165	163	163	163	,	<b>\$433</b>
Bark of the Unicern 222 Third St. Combridge, Mass. 02142	192K	Yes -	Yes	Yes	Yes	Yes	No	No	Optional	Yes	\$395
The Final Word										AND ALL AND A	18 78
Martin Marletta Data Systems P.O. Box 2392 Princeton, N.J. 08540	256K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	\$500
Writit											
Hotasett Corp. Suite 12 6509 W. Frye Road Chandler, Arix. 85226	256K	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes	\$199
Benchmark Word Processor								1			
Micro Architect, Inc. 6 Great Pines Ave. Burlington, Mass. 01803	128K	Yes	No	No	No	No	No	No	Yes	No .	\$39
Word-X											
Micro Business Products, Inc. P.O. Box 530 Wayne; N.J. 07470	256K	Yes	No	No	No	Yes	Yes	No	No	Yes	\$160
Workwriter 2			111.00						11-150		
Micropro International Cerp. 33 San Pablo Ave. San Rafael, Calif. 94903	192K	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes	\$495
Wordstar Professional 3.3										N	\$495
Wicropro International Wordstar 2000, Release 2	256K	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	\$495
P.O. Box 97017 16011 Northeast 36 Way Redmond, Wash. 98073	256K	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	\$395
Microsoft Word 3.0											
Multimate International Corp., an Ashton-Tate company 52 Oakland Ave. N. East Hartford, Conn. 06108	128K	Yes	Yes	Yes	No	No	No	No	No	No	\$145
Just Write	DESK	Vac	Vec	Ven	No	Yes	No	No	Yes	Yes	\$495
Multimate International Multimate Professional 33 Series Word Processor	256K	Yes_	Yes	Yes	No	165	NO		163	,63	4433
Meltimate International	320K	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	\$595
Multimate Advantage 360							7	1.00			
Multimate International Multimate Executive Word Processor	320K	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	\$495
Office Schröses, Inc. 2802 Coho St. Madison, Ws. 53713	256K	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	\$445
Office Writer 4.0			THE REAL PROPERTY.			100		到6.5名建	HT SAUSE	ER SEE	A TABLE
Owl Software Corp. Suite 210 15643 Shermon Way Van Nuys, Calif. 91406 A-B-C	192K	Yes	No	No	No	No .	Yes	No	Yes	Yes	\$240
Paladia Software Corp.	192K	Yes	Yes	Yes .	No	No	Yes	No	- No	Yes	\$149
Suite 7E 3255 Scott Bivd. Santa Clara, Calif. 95054 Visivord Plus											

		100	1	11	11	1	11	11	11	18	Price
ndor/Product	192K	Yes	Yes	Yes	No	No No	Yes	No	Yes	Yes	\$395
iulte 100 2777 Jones Road louston, Texas 77070	1921	res	100	163	140	140	163	110	100	700	
The Palantir Word Processor 3.0								-			
Paparback Software International, Inc. 1830 9th St. Jerkeley, Calif. 94710	128K	Yes	No	No	Yes	Yes	No	No	Yes	Yes	\$69.95
Executive Writer	(a)	30.00	TO INCHAS		Al-	Van	Vee	Yes	Yes	Yes	\$295
Peachtree Software, Inc. 1355 International Blvd. Norcross, Ga. 30093	128K	Yes	Yes	Yes	No	Yes	Yes	165	165	165	4250
Peachtext 5000								,			
Practicorp International, Inc. 44 Oak St. Newton Upper Falls, Mass. 02164	256K	Yes	No	No	No	Yes	No	No	Yes	Yes	\$99.95
Practiword											
Professional Software, inc. 51 Freemont St. Needham, Mass. 02194	256K	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	\$149
Write'n Spell							-				
Quadratron Systems, Inc. Sulte 1800 15260 Ventura Blvd. Sherman Oaks, Calif. 91403	640K	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	\$495
Q-One			Want Co				Marie Tolland			e-13-4,	TO COUNTY OF THE
Quark, Inc. 2525 W. Evans Ave. Denver, Colo. 80219 Word Juggler	128K •	No	Yes	Yes	No	No	No	No	Yes	Yes	\$99
R Systems, Inc. 10310 Markinson Road Dallas, Texas 75238	256K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	\$295-\$895
R Word										S 07-30	4-78 50 12-78
R Systems R Office	256K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	\$495-\$1,295
Readiware Systems, Inc. P.O. Box 515 Portage, Mich. 49081 Readiwriter	256K	No ·	No	No	Yes	Yes	No	Yes	Yes	Yes	\$395
Same Corp. 2700 Northeast Expwy. Atlenta, Ga. 30345	320K	No	No	No	No	No	Yes	No	No	Yes	\$295
Samma Word I											
Samna	320K	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	\$550
Samna Word III	- CICH	S SEE	MY LEW	No.	- Van	Vac	. Vec	Vae	Yes	Yes	\$695
Samna +	512K	No	Yes	Yes	Yes	Yes	Yes	Yes	165	165	
Schuchardt Software Systems, Inc. P.O. Box 13778 San Rafael, Calif. 94913	128K	Yes	No	No	No	No	No	No	Yes	Yes	\$195
Inteword					-	-	41		34	V	\$189.95
Sof/Sys, Inc. 4306 Upton Ave. Minneapolis, Minn. 55410	128K	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	₹89.85
The Executive Secretary	THE PERSON	Marie L						Chr. Co.	2.00	a term	
Softest, Inc. 555 Goffle Road Ridgewood, N.J. 07450	256K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	\$500-\$2,50
Lex Word Processing		-	-								
Software Publishing Cor P.O. Box 7210 1901 Landings Drive Mountain Wew, Calif. 94035		Yes	Yes	Yes	No	No	No	No	Yes	Yes	\$140

	////	Pile Online	No.	3/		1	11	11	//	18	1,000
endor/Product	2269	4	9	94	42	34	0.4	00	40	24	Price
Summa Technologies, Inc. 78885 S.W. Cirrus Beaverton, Ore. 97005	256K	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	\$295
Freestyle						Man	21-	M	Min	W	4-0-
ICI Software Research, Inc. 1190-8 Foster Road Las Cruces, N.M. 88001	512K	Yes	No	No	No	Yes	No	Yes	No	Yes	\$595
T <sup>3</sup> Scientific Word Processing System											
TCS Software, Inc. Suite 600 6100 HMcroft Ave. Houston, Texas 77081	256K	Yes	No	No	e No	No	No	No	Yes	Yes	\$149
Q Word											400
Texaseft, Inc. P.O. Box 1169 Cedar HIII, Texas 75104	128K	Yes	No	No .	No	Yes	Yes	No	Yes	Yes	\$99
Wersetext Word Processing											
Thorn EMI Computer Software, Inc. 3187-C Airway Ave. Costa Mesa, Calif. 92626	128K	Yes	Yes .	No	Yes	No	No	Yes	Yes	Yes	\$199
Perfect Writer							,				
TNY Software, Inc. 34069 Hainesville Road Round Lake, III. 60073	128K	Yes	Optional	No	No	Yes	No	No	Yes	Yes	\$35
My Word											
United Software Industries, Inc. Suite 200 8399 Topanga Canyon Bivd Canoga Park, Calif. 91304	128K	Yes	Yes	No	Yes	No	Yes	Yes	No 6	Yes	\$149.95
Einstein Writer											
Wang Laboratories, Inc. One Industrial Ave. Lowell, Mass. 01851	256K	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	\$250
Wang Word Processing for the IBM PC											
Wordperfect Corp. 329 N. State St. Orem, Utah 84057	256K	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not available
Wordperfect 4.1											
Tyquest, Inc. 3 Loomis St. Bedford, Mass. 01730	192K	No	No	No	Yes	Yes	Yes	No	Yes	Yes	\$295
Xywrite II Plus										Lace le	
Xyquest	256K	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	\$395
Xywrite III				- 1			and the same of the		16 7 6	21 15 A	No. of the least

#### In Depth

## Source code under lock and key

Placing software source code into escrow offers a form of protection for vulnerable users and vendors alike. A new wave of escrow firms is drawing up agreements that may withstand even the rigors of bankruptcy law.

#### By REGINALD WELLER and SHELLEY WALL

onsider the following scenario: You, an oscilloscope manufacturer, license an operating system from a start-up software firm and embed it in a controller in your product. A few months later, you discover that erratic output from an operating system call causes the oscilloscope to give inaccurate readings.

Since, according to the licensing agreement, the system's vendor is obligated to fix any bugs found, you quickly call the vendor's office -- only to find it has gone out of business. If you cannot access the vendor's source code, your oscilloscope will be rendered unmarketable until replacement software is found and customized.

The above story, although fiction, is based in reality. When Art Benjamin

Associates Ltd. went out of business in March 1982 [CW, April, 12, 1982], it left approximately 80 users of its Act/1 CICS programming aid without support or maintenance.

One solution that has emerged in response to users' fears that such a situation could happen to them is the escrowing of code with a neutral third party as escrow agent.

Software developers, in licensing a product to users, need to protect the proprietary source code they have written. While they wish to guard against unauthorized use, piracy and illegal copying, they also want to avoid legal disputes.

In contrast, users, as licensees, need to protect their software investments from discontinuance of product support and maintenance. Although a large, stable licensor is not likely to go out of business, a licensee could still suffer significant financial loss if the product line in question is discontinued as the result of a strategic business decision by the licensor. The prospect of time-consuming legal remedies exacerbates the licensee's vulnerability.

Weller is the president of National Safe Depository of San Jose, Calif. Wall is an associate at the law firm of Fenwick, Davis & West in Palo Alto,

#### **Protecting interests**

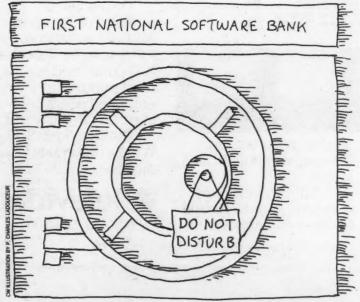
Commonly, software licensing agreements give the licensee the right to use only the licensor's machine-readable object code. The licensor retains the human-readable source code in order to prevent misappropriation of proprietary materials.

The object code is, in effect, an encrypted version of the source code that needs regular updating and modification whenever the source code is revised. Since software programs are often released before they are fully debugged, licensees may need continued access after initial purchase. The escrow procedure provides the parties to a software licensing agreement with an opportunity to protect their respective interests safely and economically.

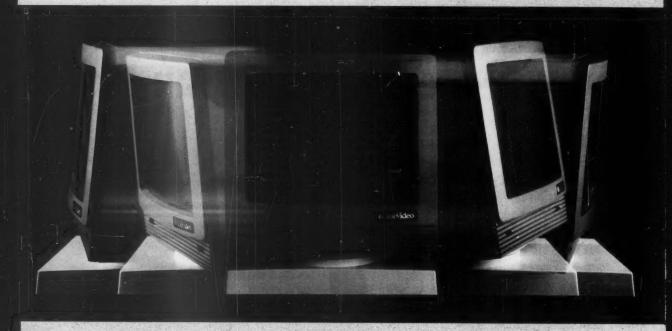
Setting up the procedure whereby source code is deposited into escrow can be simple and flexible. The escrow agreement should be separate from the underlying licensing agreement that controls the relationship between li-

censor and licensee.

Once the licensor and licensee agree that a software escrow is necessary



## The TeleVideo 905 terminal. What a difference \$10 makes.



Let's face it; there are a lot of \$399 terminals being sold these days. You get a basic box, a few tacked-on bells and whistles, and not a whole lot more.

But now there's the TeleVideo\* 905. At \$409,

	TELEVIDEO	WYSE		
FEATURES	905	WY-36		
ndividual programmable function keys	16	4		
Filt and swivel standard	Yes	No		
High contrast super dark Mat- sushita screen	Yes	No		
WordStar mode	Yes	No		
Full-size keyboard	Yes	No		



it has a feature set so powerful, your customers will think they're sitting at an expensive workstation.

For example, there's a

sleekly designed monitor case with full tilt and swivel.

A full-size keyboard with sculptured keycaps for smooth, comfortable

typing. Sixteen nonvolatile, programmable function keys. Keyswitches that have been tested to 100,000,000 strokes. Even an enhanced numeric keypad.

There's also a buffered printer port. And, of course, compatibility with the TeleVideo 925 command set, the most popular and widely emulated ASCII command set in the world.

The TeleVideo 905. What a difference \$10 makes.

TeleVideo®
Settle for more.

TeleVideo Systems, Inc., 1170 Morse Avenue, Sunnyvale, CA 94088-3568, (408) 745-7760 AMSTERDAM: 31.2503.35444, PARIS: 33.1.4687.34.40, LONDON: 44.9905.6464

©1996 TeleVideo Systems, Inc. WYSE is a trademark of Wyse Technology. WordStar is a registered trademark of MicroPro International Corporation

#### See your TeleVideo distributor.

CALIFORNIA TELEVIDEO REGIONAL SALES OFFICES Sunnyvale (408) 745-7760 Newport Beach (714) 476-0244 D.H. MINICOM Los Angeles (213) 483-2400 DAVID JAMISON CARLYLE CORP. Culver City (213) 410-9250 DIGITAL SOURCE, INC San Diego (619) 569-9333 DUCOMMUN DATA SYSTEMS Cypress (714) 220-6588 **EMERITUS** Fresno (800) 325-9892 KIERULFF. ELECTRONICS, INC. San Jose (408) 220-6300 LEASAMÈTRIC Foster City (415) 574-4441 PREMIER SOURCE DISTRIBUTING Irvine (714) 261-2011 RC DATA San Jose (408) 946-3800 U.S. INSTRUMENT RENTAL San Mateo (415) 572-6600 VIVITAR COMPUTER **PRODUCTS** Santa Monica (213) 829-3672 WESTERN MICRO SYSTEMS Mountain View (415) 964-2050 FLORIDA **GENTRY ASSOCIATES** Orlando (305) 859-7450 GEORGIA TELEVIDEO REGIONAL SALES OFFICE Norcross (404) 447-1231 INFOTEC, INC. Atlanta (404) 458-1400 ILLINOIS TELEVIDEO REGIONAL SALES OFFICE Schaumburg (312) 397-5400 DATA ONE Prospect Hts. (312) 520-1300 PRO COM SALES Elk Grove Village (312) 860-1123 TEK-AIDS INDUSTRIES Arlington Hts. (312) 870-7400 UNITED STATIONERS Forest Park (312) 699-5000 INDIANA **NASH & ASSOCIATES** Indianapolis (317) 925-1050 MARYLAND FEDERAL DATA CORPORATION Rockville (301) 294-9682 MASSACHUSETTS TELEVIDEO REGIONAL SALES OFFICE Woburn (617) 890-3282 ARROW ELECTRONICS Woburn (617) 938-8700 BUTLER ASSOCIATES, INC. Newton (617) 964-5270 STRATUS COMPUTER Marlboro (617) 460-2000 MICHIGAN MIDCOM COMMUNICATIONS Southfield (313) 353-5696 STAR-TRONIC Farmington Hills (313) 477-7586 MINNESOTA AVNET COMPUTER

TECHNOLOGIES

Eden Prairie (612) 944-1114 BENCHMARK COMPUTER SYSTEMS Minneapolis (612) 831-2300 PC EXPRESS Burnsville (612) 894-9153 **NEW JERSEY** DATA STORE Cherry Hill (609) 779-0200 NEW YORK TELEVIDEO REGIONAL SALES OFFICE Syosset (516) 496-4777 ARROW ELECTRONICS Melville (800) 323-4373 MANCHESTER EQUIPMENT COMPANY Hauppauge (516) 435-1199 TRANSACTION CONCEPTS, INC. Forest Hills (718) 544-8898 TRICOM GROUP W. Hempstead (516) 483-9700 NORTH CAROLINA PEN-TECH SALES Greensboro (919) 852-6000 OHIO COMPUTER PLACE Brooklyn Heights (216) 351-7444 E.Q.S. SYSTEMS Chesterland (216) 729-2222 REYNOLDS & REYNOLDS Dayton (513) 443-2264 W.C. KOEPF & ASSOCIATES Chargin Falls (216) 247-5129 OMEGA DATA, INC. Hillsboro (503) 640-3995 PENNSYLVANIA ARCH ASSOCIATES Fernwood (215) 284-0327 TELEVIDEO REGIONAL SALES OFFICE Irving (214) 550-1060 CARTERFONE COMMUNICATIONS Dallas (214) 630-9700 INTERPRINT, INC Austin (800) 637-0600 INTERPRINT, INC Houston (713) 465-0580 INTERPRINT INC Plano (800) 527-5113 MICRO SOURCE OF TEXAS Richardson (214) 690-5111 US DATA CORPORATION Richardson (214) 680-9700 WASHINGTON DATEC, INC Seattle (206) 575-1470 DYNAMIC SYSTEMS NORTHWEST Mukilteo (206) 745-5311 VIRGINIA MARVA DATA SERVICES Falls Church (703) 893-1544 CANADA ARROW ELECTRONICS CANADA LIMITED Montreal, Quebec (514) 735-5511 COMPUTER DISTRIBUTION, INC. N. Vancouver, BC (604) 984-0641 DATAMEX, LIMITED Montreal, Quebec (514) 355-4923

#### TeleVideo\* Settle for more.

#### 77

Although a large, stable licensor is not likely to go out of business, a licensee could still suffer significant financial loss if the product line in question is discontinued as the result of a strategic business decision by the licensor.

and appropriate, they must negotiate the critical elements of the escrow agreement. Again, the interests of the licensor and licensee are likely to conflict. The licensor will want to release as little of the source code as possible and only under extreme circumstances, such as bankruptcy. The licensee, on the other hand, needs to ensure that all revisions and updates are included in the source code deposit and that access to the escrow materials is possible under all adverse circumstances: discontinuance of product support, acquisition of the licensor by another vendor, discontinuance of product line and other situations less extreme than bankruptcy

Basic types. The most common type of escrow agreement is a three-party arrangement among the licensor, licensee and escrow agent. Also prevalent is the two-agreement arrangement: one between the licensor and the escrow agent for deposit of the materials and the other between the licensee and the escrow agent for release.

Another type is a two-party agreement between the licensor and escrow agent for the benefit of multiple users, or licensees of record. This format avoids the expense and burden of establishing repeated escrows that are identical in nature. Additions or deletions to the list of the licensees are submitted by the licensor. Written confirmation from the escrow agent provides an accurate record of potential recipients of the escrowed materials.

Trust agreements are a new development in escrows. Such agreements are designed to help shield the escrow from a trustee in bankruptcy by removing title to the source code from the licensor's estate. The escrow agent, as trustee, holds title in trust for the benefit of the licensee, who holds beneficial or equitable title.

Escrow materials. The materials deposited into escrow must be sufficient to enable the licensee to maintain and enhance the program independently. Besides source code, support documentation should include such items as type of hardware used, the programming language, printouts, flow charts, schematics and even machine-readable object code. Any escrow agreement must carefully specify all material to be deposited to ensure that the purpose of the escrow is not undermined.

Updates. A common characteristic of most software is the ongoing need to debug, update, enhance or modify. These periodic revisions must be added to the escrow and then acknowledged in writing to all parties by the escrow agent to create a written record during the life of the software. As with the original deposit, the update process must be clearly drafted into the escrow agreement.

Verification. Licensees commonly ask how they can be certain that the licensor has indeed deposited into escrow the authentic and complete material required by the agreement. One effective method is to have a third-party verifier. However, such a procedure can be expensive and cumbersome, since to do anything more than spot-check a complicated and lengthy source code often proves time-consuming. With frequent updates, the difficulty increases.

One less problematic alternative

One less problematic alternative has the licensee run the deposited source code (or other escrow materials) with the applications it is intended for, with proper witnesses, before approving the deposit of the materials into escrow.

Another method for achieving compliance is to draft language into the agreement whereby the licensor warrants that all materials deposited or to be deposited conform with the agreement. Since normal contract remedies may be insufficient, compliance by the licensor may be further encouraged by use of liquidated damages.

Finally, the escrow agent, in addition to the written acknowledgement procedures, can play an active role—carefully prescribed in the agreement—of inspecting materials received for deposit.

Access. Control of access to the escrow documentation is another important provision of the escrow agreement. Ideally, storage will be in a safe deposit box in a climate-controlled vault, whereby all access can be positively identified and recorded. Each escrow should be stored in its own individual box. Licensees usually will be required to give written advance notice for access so that the licensor, at its option, may be

#### Release procedures and conditions

Time is truly of the essence when a licensee finds his investment in a software program jeopardized by the licensor's failure to maintain the program, whatever the cause. Extended delays must be avoided.

Normally, the licensee wfll serve written notice to the escrow agent, with a copy to licensor, that a default condition has occurred sufficient to trigger a release of the escrowed software under the agreement. The escrow agent must then, in turn, notify the licensor within the time period specified in the agreement. If the licensor does not respond within a specified number of days, the escrow agent may release the source code, or a copy thereof, to the licensee.

Precise and detailed contractual provisions for the release of source code and documentation to the licensee are critical to an effective escrow. The provisions mainly concern the economic viability of the licensor, especially the likelihood of bankruptcy, and the licensor's maintenance obligations as defined in the licensing and escrow agreements.

The escrow agreement should be structured to provide for release of the escrow materials in the event a

#### In Depth/Software Escrow

licensor's failing economic condition jeopardizes its performance under the license agreement. Such circumstances commonly include ceasing to do routine business, discontinuing the software product at issue and bankruptcy.

Lack of maintenance by the licensor has many possible causes. A program can be discontinued for business reasons or as a result of a merger or buy-out. Key technical personnel can leave the company. Documentation can be lost, with no backup available. Financial problems, often minor at first and more pervasive later, can result in cutbacks that jeopardize the ongoing maintenance and enhancement process. Any or all of these circumstances would trigger the licensee's urgent need to have access to the source code in order to support the licensed program independently.

When the licensor dis-

putes a licensee's claim of default, the dispute resolution provisions of the escrow agreement are activated. Improperly drafted dispute procedures can defeat the very purpose of the escrow. Some possible solutions to expedite release of escrowed source code in the event of a dispute include the following:

Injunction. If the licensor unjustifiably refuses to allow release of the escrow materials, licensees may obtain a temporary restraining order to prevent the licensor from acting to prevent release.

To increase their chances for success in having the court grant a preliminary injunction, licensees should see that appropriate language is drafted in the escrow agreement.

Arbitration. An arbitration clause is frequently used in software escrows. This provision specifies that the parties have to present their respective cases before a predetermined arbitrator within a few days and confine the arbitration to the very narrow issue of whether a default has, in fact, occurred. The arbitrator would be required to render his opinion within a similarly short time frame.

Liquidated damages.
This technique, common to real estate transactions, serves primarily to discourage the licensor from improperly objecting to release of the code.

The cost of a software escrow is a negotiable matter. Either party may pay, or the fees may be shared. Multipleuser escrow expenses are borne by the licensor, often as a value-added marketing benefit for the licensees. Costs for the release of materials are typically paid by the licensee requesting the release.

#### Legal issues

Although the scope of the legal issues raised by the escrow procedure is considerable and cannot be treated fully here, it is important to acknowledge the potential impact of bankruptcy law in particular on the effectiveness of the escrow release provisions.

Whether or not an escrow will succeed in its essential purpose if the licensor bankrupts depends on all parties resolving the following issues:

 Is the software escrow an executory contract that can be rejected by the

#### SCIENCE / SCOPE®

Twenty years ago on June 1, Surveyor 1 made the first soft landing on the moon, giving scientists their first close-up look of the lunar surface and blazing a trail for the manned Apollo missions three years later. The three-legged spacecraft, built by Hughes Aircraft Company, landed one second ahead of the originally predicted time and just nine miles from the predicted target point after traveling 240,000 miles. In the following eight months, Surveyor televised 11,150 pictures, photographed the solar corona of the setting sun, made a color composite photo of the lunar surface, and measured the hardness of the lunar surface. By January 1968, four other Surveyors had made soft landings on the moon. They provided detailed scientific information about the physical and chemical character of lunar materials and added immeasurably to the understanding of the physical processes that shape the moon's surface.

Electronics engineers and doctors have created an implant to improve the hearing of profoundly deaf people. The device uses a microphone and pocket-sized signal processor to convert sound waves to electrical impulses. A transmitter behind the ear sends these electrical signals through the skin to a nickel-sized receiver/stimulator implanted in the mastoid cavity. From there, signals travel along an electrode array threaded to the snail-like cochlea of the inner ear. Auditory nerve fibers receive these electronic signals and transmit them to the brain—tricking it into thinking the ear can hear normally. The electrode of the electronic ear is protected by a plastic coating material, which must provide electrical reliability and long life. Since most polymer insulations tend to lose adhesion in body fluids after a period of time, the National Institutes of Health has asked Hughes to subject three coating materials to intensive testing. One plastic was created by Hughes, originally for high-temperature electronic and structural uses; the others were developed by Union Carbide and Dupont.

Confusing enemy weapons so they plunge harmlessly into the ocean is the job of an electronic warfare system now being installed on U.S. Navy aircraft carriers. The SLQ-17A shipset can deceive an enemy missile's guidance system by transmitting a ghost image of a Navy carrier. The hostile weapon locks onto this false image and veers away from the real ship. Hughes delivered the most recent system for installation aboard the USS Independence (CV-62) and is continuing to provide this essential warfare system to Navy aircraft carriers.

A new launcher for Amraam and Sidewinder missiles will add commonality to U.S. Air Force and Navy fighters, thus helping to reduce procurement and maintenance costs. The rail launcher uses common modules to allow an interchange of parts between launchers on different aircraft. Hughes is building more than 600 launchers for Air Force F-15 and F-16 aircraft. Eventually the launchers will be installed on the Navy's F-14 and F/A-18 aircraft. In addition, preliminary work is under way to adapt the launchers to Britain's Tornados and Sea Harriers.

An ultramodern facility spanning 1.75 million square feet is the showcase where outstanding Hüghes engineering combines advanced manufacturing techniques and production processes. Our complex is complete, so we're looking for experienced and graduating engineers to work on such programs as infrared thermal imaging systems, laser rangefinders and designators, artificial intelligence, signal processing, VLSI, component qualification, hybrid microcircuitry, and focal planes. Send your resume to Hughes Electro-Optical and Data Systems Group, Professional Employment, P.O. Box 913, E8/G101, Dept. S3, El Segundo, CA 90245. Equal opportunity employer. U.S. citizenship required.

For more information write to: P.O. Box 45068, Los Angeles, CA 90045-0068

HUGHES

Subsidiary of GM Hughes Electronics



# Even if something inside it stops, it goes.

In the past, if you needed a fault-tolerant computer, you had to make certain sacrifices.

Namely speed and economy.

One fault-tolerant system tied up two processors to do one processor's job.

And the other depended on software that slowed everything down. Well, NCR has invented a new system that changes that.

It's the NCR 9800.

Set up a 9800 for fault-tolerance and, if a module fails, the other modules take over for it while continuing to do their own work.

The 9800 keeps running during a processor failure, or a software failure. It even keeps running during routine maintenance and upgrading. What's more, critical files can be duplicated, so even if a disk fails, your

files are available.

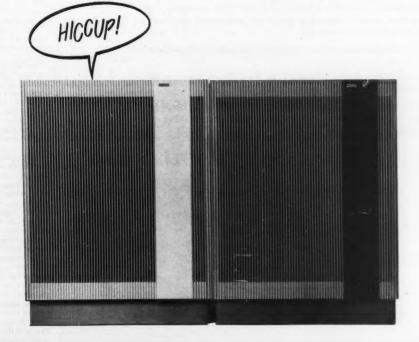
The NCR 9800 is built with field-proven 32-bit VLSI technology that has fewer components than conventional technology. So the chance of failure is very slim.

Because if something's not there, it can't break.

So if you need a computer that's hard to stop, you know where to go. For more information, call 1-800-CALL-NCR.

NCR9800. The evolution of the mainframe.

NCR



#### In Depth/Software Escrow

trustee in bankruptcy?

- Do the escrow materials constitute property of the bankrupt's estate?
- Will the automatic stay procedure prevent the escrow agent from delivering the escrow materials to the licensee?

Although bankruptcy law could have an adverse impact on the effectiveness of an escrow, numerous commentators have suggested viable remedies that, while not eliminating the risk, serve to reduce it as much as possible under the law. When drafting an escrow agreement, legal counsel should be sought to ensure that the document provides maximum protection for both parties.

#### Role of the escrow agent

Traditionally, banks, accounting firms and lawyers undertook es-

7

The 'liquidated damages' clause, common to real estate transactions, discourages the licensor from improperly objecting to release of the code.

crows. But, as the sophistication and complexities involved have increased, companies specializing in software escrows have emerged. An escrow firm must be knowledgeable in the legal and technical details required to furnish clear, flexible guidelines throughout the life of the software program.

The duties of an escrow agent can be divided into two general categories: administration and physical protection

Administration. An experienced

escrow agent handles many escrows comprising a wide variety of needs and problems. The agent works closely with attorneys and is aware of the latest trends, techniques and legal developments. The agent's role can be as active or passive as the parties to the escrow feel is necessary.

Legal assistance is always necessary before executing an escrow agreement. Nevertheless, the escrow agent should be well qualified to suggest an escrow format that will meet the needs of the particular case.

Once the escrow framework has been established, ongoing administrative expertise is essential. The escrow materials must be deposited and acknowledged in writing to all parties.

Other administrative services that can be performed by the escrow agent include the following:

- Notification of opening of escrow. This establishes for all parties the actual completion of the escrow agreement and its commencement date, that is, the date of the original deposit.
- Acknowledgement process. Every receipt of material for an escrow should be acknowledged in writing, usually to all parties. Each item in the update or modification must be identified specifically in order to create an audit trail over the life of the
- Follow-up. Many of the events in the escrow process need to be tracked over time to make sure that every required procedure is performed when required. Computerized records management systems are an excellent means for an escrow agent to provide effective, ongoing administration and follow-up.
- Verification. As discussed earlier, the escrow agent can, at a minimum, examine the materials deposited to determine conformity to the agreement provisions. Depending upon the degree of verification desired by the parties and upon the technical complexity involved, the agent can act as, or arrange for, an outside expert in the verification process.
- Intermediary. Most escrows provide a mechanism for settling disputes, usually by means of the courts or arbitration. The escrow agent can also serve as an intermediary, but his role should be clearly defined in advance, preferably in the escrow agreement itself.
- Termination. The termination of an escrow must be carefully executed in writing by the escrow agent. The escrow agent must also return all materials to the proper party.

Physical protection. The other principal function of an escrow agent is to physically protect and preserve the material deposited in escrow.

Storage ideally should be in a vault or custom-built vital-records room designed to protect computer media over long periods of time. Climate control and fire protection are normal features of such depositories.

To preserve the integrity of each escrow, the documentation should be stored in individual safe deposit boxes or containers. Escrow materials should not be commingled, both to prevent errors and to provide accurate transaction records.

The escrow agent should be able to maintain absolute control of access to the storage area so that permanent logs of every access can be created. Authorization for any access should be in writing in advance.

Escrow agreements can provide a viable, effective means for satisfying the sometimes conflicting needs of the parties to a software licensing agreement. Although, as noted, the reliability of the escrow procedure in the event of bankruptcy is uncertain, escrow agreements still provide the parties to a software license agreement with a measure of protection that is difficult to achieve by any other means.

# Save 12 Months of Wasted Effort.

## Attend a free 4-hour 4GL/DBMS Seminar

12 months after you purchase a DBMS you'll figure out what's wrong with it. The features that looked so friendly in the demo turn out to be enemies to your programmers. Or the so-called "4GL" turns out to be just SQL or C.

So take a morning to learn what's available. System 1032° is an integrated 4GL/DBMS rich in features that let you write exactly the applications you want. Screens entirely independent of data structures, a versatile report writer, user-definable commands.

Yet it's so straightforward that end-users query the data directly, without hand-holding,

There is something System 1032 doesn't do. It's so closely adapted to the VAX architecture that it only runs under VAX/VMS.

Once you see what you can do with System 1032, you'll want a hands-on trial. So we'll give you a free 60-day trial evaluation (normally \$125). To register, call (617) 661-9440.

Minneapolis/St. Paul	June 17
Chicago, Illinois	June 19
San Francisco	July 15
San Jose	July 17
Toledo	August 5
Ann Arbor	August 7



1000 Massachusetts Avenue, Cambridge, MA 02138 (617) 661-9440

# AT&T IS IN A WORLD OF DIGITAL SOLUTIONS.

 $oldsymbol{u}$ 

For every business in the world, from the largest corporation to the smallest chain of stores, AT&T has developed a digital information transfer solution. With the AT&T ACCUNET° Family of Digital Services. An extensive line of digital services that support a wide range of business applications.

Providing businesses with high-quality, endto-end digital communications. From low-volume, low-speed intermittent transmissions to high-volume, high-speed continuous transmissions of data, image, voice-virtually any form of information.

All with excellent digital reliability and accuracy.

But we offer you something even more important than these digital services: the expertise of

our people.

Because we can help you early in the design and decisionmaking process to select an ACCUNET Digital Service, or an integrated mix of services, that best meets your company's specific communications needs.

And we'll work closely with you on an ongoing basis to maintain and modify your system. To ensure your ACCUNET Service is always available and operating at peak efficiency. Now, and on into the 21st century.

To illustrate the variety, adaptability and versatility of AT&T ACCUNET Digital Services, we've compiled this set of typical questions from

business needs.

And AT&T answers that could well improve the way you do business.

Q: How can I decrease my · order-processing time and reduce my inventory levels?

A: AT&T's approach to Electronic Order Exchange can help you do just that. With an on-line. intercompany network for order processing among suppliers, manufacturers, distributors, sales agents and retailers. Purchase orders, inventory availability and other messages can be transmitted directly between companies. So inventory levels and orderprocessing time can be reduced.

**ACCUNET Digital Services** make all this possible. With (depending on the extent of your processing needs) AT&T ACCUNET® Packet Service or AT&T DATAPHONE® Digital Service.

For low- to medium-volume users with geographically dispersed locations that don't warrant a strictly dedicated network like DATAPHONE Digital Service, ACCUNET Packet Service is an economical choice. Softwarecontrolled, this public switched packet data network supports digital quality, high-capacity dedicated access for short bursty information at speeds of 4.8, 9.6 and 56 kilobits per second (kbps).

In addition to Electronic Order Exchange, ACCUNET Packet Service is also ideal for

electronic mail.

credit authorization and reserva-

ACCUNET Packet Service is available via 99 access points in the U.S., with international access to Canada, the U.K., France, Italy and Japan, with additional countries planned for 1986.

2. Use a critical and transmit large amounts of Q: I have a critical need to data, but not enough to cost-justify a dedicated private network. What service would work best for my company?

A: AT&T ACCUNET® Switched 56 Service is ideal for that situation. Providing you with reliable, high-speed digital data



distance-sensitive rate structure.

ACCUNET Switched 56 Service is currently available through over 30 access points in the U.S., with additional access points expected by the end of 1986.

Q: How can I efficiently man-3. Q: How can I efficiently manage consolidated processing of inventory, payroll and pricing information among my different locations?

A: Bulk data transfer allows you to consolidate many of your data applications among numerous company locations on a shared network, with data concentrations at economical points. Depending on the volume of your information and the geographic dispersion of your offices, there are several AT&T ACCUNET Services that can fit the bill: AT&T ACCUNET Switched 56 Service, AT&T DATAPHONE Digital Service, AT&T ACCUNET® T1.5 Service managers faced with complex tions processing. and AT&T ACCUNET® Reserved

1.5 Service.

**DATAPHONE** Digital Service is especially appropriate for data transfer applications requiring the highest accuracy, efficiency and reliability. Providing digital data transfer rates of 2A. 4.8, 9.6 and 56 kbps, virtually error free, within flexible, dedicated networks. In configurations



© 1986 AT&T

that can be tailored to meet your company's specific communications needs.

Our DATAPHONE Digital Service is available in most major metro areas in the U.S., with international access

to Canada and the U.K. Plus access to France and Switzerland at the 56 kbps rate.

Q: How can I hold a 4. meeting, on short notice, with my sales team in Chicago, my buyer in Miami and my product NEW YORK manager in San Francisco?

A: With AT&T video and audiographic teleconferencing. you can 'fit' the whole country (plus many European countries) into one room for effective decision-making.

Using telecommunications channels for fully interactive video and audio, audiographic, or oneway video, two-way audio telecon-

ferences, you can increase the productivity of your key executives—and monitor travel expenses.

Depending on the extent of your needs, there are several ACCUNET Services that apply: ACCUNET Switched 56 Service, ACCUNET T1.5 Service and ACCUNET Reserved 1.5 Service.

**ACCUNET Reserved 1.5** Service offers the broadest range of features, with full-motion color video; plus audio, facsimile and graphics support.

**ACCUNET Reserved 1.5** Service is available on a part-time basis in over 40 major metro locations in the U.S., with video teleconferencing access to Canada, the U.K., Italy, France, Sweden, Switzerland and West Germany. Including data transmission to France and the U.K.

Q: I work for a large 5. Q: I work for a lar many regional and remote branch offices that must tie their

data transmission systems back to central processing sites.

And I need a digital service that can integrate all of these systems together for high-capacity transmissions between my larger locations.

A: We recommend **ACCUNET T1.5 Service** 

CHICAGO

because of its large information-carrying capacity.

Ourunnum ACCUNET T1.5 Service can integrate multiple transmission requirements (voice/data/image) and transmit them at 1.544 megabits per second (mbps) between your main office locations and remote sites.

ACCUNET T1.5 Service can also work in conjunction with **ACCUNET Reserved 1.5 Service** and AT&T SKYNET® Digital Service to expand geographic coverage.

**ACCUNET T1.5 Service is** now available in many parts of the U.S., with international connection to Canada.

> And should you need to integrate a large number of communications requirements—data, graphics, voice, we also offer the all fiber-optic AT&T ACCUNET® T45 Service, the equivalent of twenty-eight 1.544 mbps channels.

Q: I have a problem with O. timely communications between my engineering department in California and my manufacturing department in New Jersey. It's causing delivery time delays, production lags and

reduced productivity. A: What you need is a communications network linking design, engineering and manufacturing functions. By doing this, you can integrate functional technologies such as computer-aided design, engineering and manufacturing (CAD/ CAE/CAM).

This is a critical first step toward computer-integrated manufacturing, which will help you streamline information flow. reduce design, manufacturing and distribution intervals and improve the quality of both design and the finished product.

So you can model manufacturing functions and work out potential problems-before incurring actual plant or material costs.

Again, AT&T ACCUNET Digital Services make it possible. With (depending on your specific business needs) ACCUNET Switched 56 Service, ACCUNET T1.5 Service, DATAPHONE Digital Service or ACCUNET Reserved 1.5 Service.



To find out more about how our digital services can provide your business with a digital solution, talk with your account executive at AT&T.

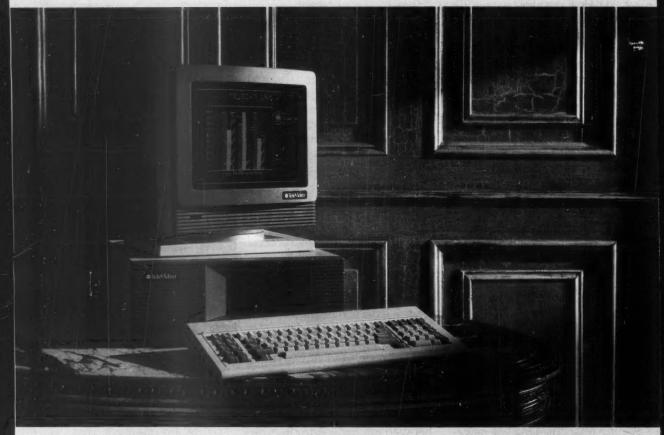
Or any one of our sales specialists at 1 800 222-0400.

The AT&T ACCUNET Family of Digital Services. A wide range of reasons why AT&T is the right choice.



The right choice.

## AT performance at an XT price. Introducing the TeleCAT-286. \$2995. Complete.



With TeleVideo, you always settle for more.

For some time, you've known exactly what kind of PC you could get with a mid-range budget.

But now, you can settle for a whole lot more. With the new TeleCAT-286, from TeleVideo.

It starts you off with everything you need. Including IBM AT compatibility. A 20MB hard disk. A 1.2MB floppy. An Intel 80286 CPU that runs at either 6 or 8 MHz. Even a high-resolution 640x 400 pixel monitor for text and graphics. Standard.

To make even better use of internal space, we socketed the TeleCAT-286 for one MB of RAM, and also included serial and parallel ports on the motherboard. As a result, we can still give you three extra expansion slots.

And we didn't stop there.
We've also designed more ergonomic features into the TeleCAT286. Including sculptured keycaps on a high-quality keyboard.
LEDs right on top of the three
critical locking keys, so they won't
get covered up by overlays. And
a footprint that's 28% smaller

than the IBM AT's. So you get more of your desk back, too.

There's a lot more we could say about the TeleCAT-286. But it's an even better idea to get your hands on it. So call 1 (800) TELECAT, Dept. 133, and we'll tell you where you can try one.

The TeleCAT-286. Our 20MB version is \$2995; 30MB, \$3495. For high performance at a low price, don't settle for less.



TeleVideo Systems, Inc., 1170 Morse Avenue, Sunnyvale, CA 94088-3568 • (408) 745-7760

C1986 TeleVideo Systems, Inc. IBM is a registered trademark of International Business Machines, Inc. System graphics by Chartmaster Checking Resources

#### In Depth

# Revival of the fittest: New vigor for your development life cycle

Too many DP shops, taken with the wonders of 4GLs and code generators, let their systems development life cycle methodologies fall into disuse and disrepair. Best bet: Don't let rust set in to begin with.

#### By MARK DUNCAN

ome say the last thing the DP world needs is more talk about the systems development life cycle. A number of noticeable trends are beginning to make this remark ring true.

First, the tidal wave of commotion caused by the "instant productivity" of fourth-generation languages and program code generators makes a systems development life cycle methodology appear almost archaic.

Second, a glut of inexpensive, vendor-supplied packaged software, versatile enough to balance multicorporate financial statements as easily as domestic checking accounts, has given users a practical alternative to inhouse applications development.

Finally, despite the young age of the DP industry, it would seem that we have experienced enough to obviate repetitive talk about "how best to do things." And yet the systems development life cycle is constantly topical. There seems to be no limit to the extent to which this methodology can be refined, embellished, modified, rewritten and even automated.

It would be easy to conclude that all the attention paid to systems development life cycles occurs because they are inherently flawed, generate too many exceptions to the rules and, in a technological environment that changes daily, become more cumbersome than practical. But the cause is often a much more fundamental affliction — having insufficient means for supporting a systems development life cycle to keep it alive and kicking.

In the initial enthusiasm that generally accompanies the implementation of a new development life cycle methodology, an effective means for its continued support is easily overlooked, resulting in the premature death of the methodology. Before discussing how this may be prevented, two observations must be made concerning the systems development life cycle's definition and disposition.

#### Definition and status

The "IEEE Standard Glossary of Software Engineering Terminology" provides a practical definition for the software life cycle:

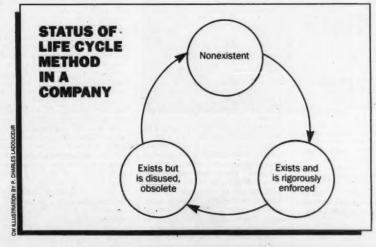
"The software life cycle is that period of time that starts when a software product is conceived and ends when the product is no longer available for use. The software life cycle typically includes a requirements phase, design phase, implementation phase, test phase, installation and checkout phase, operation and maintenance phase and, sometimes, retirement phase."

While this definition may not exactly represent all systems development life cycles, a logical, phased approach is a characteristic common to most systems development methodologies. Though the number of phases and phase names may vary, the constituent activities are generally constant.

Broadly speaking, the status of the systems development life cycle in most DP departments falls into three categories: In Category 1, the development life cycle is nonexistent; in Category 2, the life cycle exists and is rigorously enforced; and in Category 3, the life cycle exists, but it is not used or obsolete.

There are, of course, other situations — for example, one in which a life cycle method exists but is enforced

Duncan is a systems analyst in the quality assurance section of a major Dallas bank.



#### A disused or obsolete systems development life cycle: Symptoms, causes and remedies

Symptom	Cause	Remedy		
Staff unaware of exis- tence of systems devel- opment life cycle	No publicity; buried among other standards or fragmented, unstructured with no identity			
Staff aware of it but can- not get to it easily or thinks it is not meant for them		Distribute generously — at least one per office or project; centralize with easy but well-controlled access; consider on-line option for critical parts		
Staff does not know how to use it or has difficulty interpreting it	v to use it or has new and existing staff		it or has new and existing staff quent training; quantify	
Violations, adherence go unnoticed	No means for identifying violations or verifying adherence	Institute product reviews, one outcome of which will be documented adherence and violation		
Becomes out of date, inappropriate, hence falls into disuse	No vehicle exists for up- dating it to keep up with technology, procedures and so on	Identify failures, weakness- es as well as alternative procedures — another out- come of a product review		
Applied conscientiously, but product quality is still poor	No means for verifying it works, that is, produces quality applications	Record errors, produce sta- tistics to show trends; re- late error trends back; make recommendations to improve		
Staff treats adherence very lightly, knowing consequences of not following will be harmless; nobody wants ownership	No visible management support	Best remedy is for manage- ment to provide adequate time and means for activi- ty; foster joint ownership, since poor-quality applica- tions reflect adversely at al levels		

only weakly - but these are usually transient states falling either between categories 1 and 2 or 2 and 3. So the implication is that although the categories appear to be discrete, they may in reality represent a progression of events.

Consider this scenario: An organization recognizes the need for a systems development life cycle (Category 1) and acquires one. The promise of potential benefits, coupled with the novelty of applying a new methodology, give strength and stability to the development life cycle (Category 2). But various factors organizational growth or decay, increased work load, staff turnover mandated deadlines - weaken this strength and stability. The development life cycle falls victim first to abuse, then to disuse and, almost unnoticed, assumes a Category 3 dis-

#### Preventive measures

A systems development life cycle with any of these dispositions creates a problem, or at least a potential problem, if no means exist for sup-

has diagnosed the lack of a formal systems development life cycle, it will undoubtedly go one logical step further and remedy this situation. Options that immediately come to mind include writing it in-house, using consultants to write a tailored methodology or selecting a vendorsupplied methodology with modifications With a Category 2 situation, if a systems development life cycle exists and is accompanied by a means

porting it. A Category 1 situation is easy to deal with: If an organization

for actively enforcing it, it is not unreasonable for an organization to leave well enough alone. But leaving well enough alone can sometimes be as harmful as overconsideration.

Nevertheless, in both categories 1 and 2, it is not too late to develop preventive measures to avoid a transition to Category 3. Once a develop-ment life cycle assumes a Category 3 disposition, significantly more effort will be required to revive and restore it and to develop a procedure for maintaining it, so that it does not once again fall into disuse.

77

The software life cycle is the period

of time that starts

when a software

product is

conceived and

ends when the

product is no

longer available

for use.

The best way of developing preventive measures for a certain situation is to identify and examine the causes that led to it. A systems development life cycle methodology can fall into disuse for the following reasons:

• It is not publicized and has no identity.

• It has a low degree of accessibility.

• No training in its use is provided for new and existing systems development staff and users.

• No means exist for verifying adherence to it or identifying violations against it.

· No vehicle exists for updating it to keep pace with technology, procedures, changing user expectations and so on.

 No means exist for ensuring that it still works.

• There is no visible management support.

The systems development life cycle is not publicized and has no identity. The failure to publicize and give identity to a systems develop ment life cycle is a fundamental failing of systems development manage ment. To a certain degree, DP staff members are expected to possess enough initiative to ascertain what standards exist in an organization and to what extent they are en-forced. But the onus is still on the organization to make explicit its methods and procedures

Newly recruited programmers will probably continue to do things as they have been doing most recently unless told otherwise. Ultimately this could necessitate reworking to bring applications into line with company standards. It could also affect the performance evaluation of that programmer if adherence to development life cycle standards is a contributing factor to the evaluation.

A systems development life cycle will not be the only standard methodology active within a DP department. There will be administrative standards concerned with project control; operational standards governing computer resource usage; personnel standards related to professional conduct, dress code, punctuality and so on; and other technical standards that will affect DP staff daily.

Therefore, it is important that the development life cycle methodology does not get buried or lose its significance among all the other standard procedures. While it is essential that the methodology gain acceptance as an integral part of overall departmental standards, it is equally important that it retain its own identity within those standards.

The systems development life cycle has a low degree of accessibility. Having taken the trouble to identify and advertise the methodology, it makes sense to ensure it is easily accessible. DP workers are an adventurous breed by nature. Given the choice of referring to a manual to enable them to "do it right the first time" or making a few educated guesses, they will invariably opt for the latter. They have learned that people and computers are tolerant and forgiving in dealing with experimentation, while referring to a man-

ual might be tantamount to losing face in the eyes of peers.

So everything pos sible must be done to put required information at the fingertips of those who need it. Systems development methodology documentation must enjoy generous distribution to all relevant staff. If there are limitations on this distribution, then access should be centralized with

an efficient checkout system so that valuable time is spent not looking for the rules but applying them.

The documentation must also be current and accurate. Nothing will thwart the desire to do it according to the rules more than finding that the rules are out-of-date or that they simply do not work. Consideration should be given to implementing a systems development methodology that has partial or total on-line accessibility, especially when it governs critical development activities or when its application is universal within the company.

An on-line option will also facilitate updating the methodology. Changes can be disseminated instantly to all affected staff, and paperwork will inevitably be reduced.

No systems development life cycle methodology training is provided to new and existing systems development staff and users. Advertising a systems development life cycle methodology and making it easily accessible are insufficient measures to guarantee knowledge of the methodology. DP staff members, left to their own devices, quite naturally will take the easiest or shortest route to their destinations. This is not to say that they will deliberately develop an inferior product. On the contrary, given the time and means to do a good job, very few would abuse the opportunity.

However, shortest routes will differ from one person to another. This inconsistency is undesirable, if not unacceptable, in an environment in which effective system maintenance relies on uniform product quality. Doing a good job, therefore, entails

#### SYSTEM 2000 DBMS **Drives Industry** with \$12,000 License

SAS Institute Inc. establishes SYSTEM 2000 Data Base Management System at the forefront of cost-saving productivity tools with its \$12,000 first-year licensing plan. The system includes: an integrated data dictionary, on-line query/update, a report generator, relational data base access, programming language interfaces, high-quality training and technical support, and more. In addition, users can now link SYSTEM 2000 DBMS with the SAS® System

of software to build data bases, store and retrieve data, merge and manipulate data, perform analyses, and produce reports and presentation graphics. Even Information Center users can gain access to SYSTEM 2000 DBMS through easy-to-use SAS menus.

To learn more about the most economical data base management system in the industry, write or call the SYSTEM 2000 Sales Department at SAS Institute Inc., Box 8000, SAS Circle, Cary, NC 27511-8000. Telephone (919) 467-8000. Telex 802505.

SAS and SYSTEM 2000 are registered trademarks of SAS Institute Inc., Cary, NC, USA. Copyright © 1986 by SAS Institute Inc. Printed in the USA.

more than simply getting the right answer. It getting means the right answer by applying the appropriate delife velopment cycle methodolostandards. This can only be done if those standards known.

Training in the systems development cycle methodology requires consideration at three levels.

The first and obvious level is for new DP employees. If they complete are novices. they will require more prolonged intensive instruction than if they have come with experience

from another company. In the latter case, they will in all likelihood be familiar with some form of systems development methodology and will probably only need to learn the new company's equivalent of what was practiced in the old.

The second level of training is directed at mature staff. "Mature" in this case refers to DP staff members who have been with the organization long enough to be familiar with the systems development methodology through first-hand use but require further training for one or more of the following reasons:

• The last time they used the systems development methodology was some time ago, and a refresher course is necessary before beginning another project.

• The work they have undertaken so far has only taught them a part of the methodology, and they now need to extend their knowledge.

 They have been assigned to train programmers or other DP staff and therefore require thorough familiarity with the methodology.

Because of these varied training

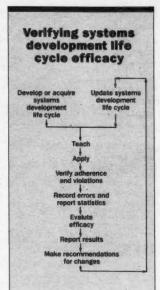
requirements, it would help if the systems development methodology training materials were modular in structure. This not only will facilitate extensive training during which the whole methodology is presented but will also allow a particular mod-ule to be taken out of context and presented in isolation for a specific

Finally, the third level of training is directed at end users and the non-DP staff who play key roles in the life cycle of a project. It is more important that these employees understand the process by which an application is developed rather than be taught the inner workings of a computer.

#### Coping with change

The impact of frequent change in end-user requirements must be demonstrated in dollars and cents, and the philosophy that "it is cheaper to fix it now than fix it later" must become second nature to them.

Training tends to be regarded as an isolated, one-time process with a definite beginning and conclusion. In



some cases this is true, but systems development methodology training must be continual and open to change in order to cope with the improvements and technological advances within

A good way to ensure that staff will be made aware of the changes automatically is to have a training program that is active throughout the year that all are obliged to take advantage of. An even better method would be stating the changes in a "departmental training policy."

To give an example: New em-

ployees will undergo 40 hours of systems development and other standards training in their first year. All other appropriate DP staff will receive 20 hours of training on an annual basis. These figures are only 2% and 1%, respectively, of a 50-week year. Quantifying development life cycle training in this way facilitates incorporating it into an individual's annual schedule and further emphasizes that the methodology is there to be learned and then applied.

No means exist for verifying systems development life cycle adherence or identifying violations. It would be ideal to develop a systems development methodology, teach it to the DP staff, tell them they have to apply it and then sit back and assume that is the end of it. Reality presents a somewhat different picture. Again, it is not that people willfully violate a standard procedure.

While it is essential that the systems development methodology gain acceptance as an integral part of overall departmental standards, it is equally important that it retain its own identity within those standards.

Rather, attitudes, performances under pressure, skill levels and interpretive abilities simply differ from one person to another.

True, the purpose of the systems development life cycle, or of any standard in general, is to smooth out these variations, yielding uniformity in product quality. But this process is not instantaneous. The methodology must be applied, the results must.

be evaluated, and then the methodology must be modified to eliminate any weaknesses, ambiguities and so

Thus, product reviews need to be incorporated into the development life cycle at appropriate points. These review outcomes are crucial in preventing the systems development methodology from taking on a Category 3 disposition. In this instance, a

Advertisement

Advertisement

#### KEY/MASTER IS IN FRONT OF SOME OF THE BEST

KEY/MASTER is the on-line software used by many companies to capture, verify and transfer data to the best applications software packages in the world. They have chosen software from companies with a proven record of per-formance, the specialized capabilities, facilities and customer support required for critical applications: accounting, human resources, manufacturing and information center software. And for their data entry requirements, these companies have turned to KEY/MASTER from TSI International, a recognized leader in on-line technology.

KEY/MASTER offers the security,

control and 100% data validation needed in supporting an organizations' information system. Because KEY/MASTER simplifies your entire data entry function, operator productivity increases and end users can simply and quickly build, test and implement fully documented applications-without programming.

KEY/MASTER has been selected as the data entry system by more IBM mainframe sites than any other software package. And, KEY/MASTER's new PC Option allows data entry on a PC, under the control and security of KEY/MASTER on the mainframe. You can download applications, then upload data to KEY/MASTER on the mainframe-even crossload verified data to other PC software.

When speed, throughput, accuracy and data integrity are vital, KEY/MASTER gives your applications software the data you want, the way you want it-without programming.

Find out for yourself. Contact the Data Entry Experts at TSI International, 295 Westport Avenue, Norwalk, Connecticut 06856, (203) 846-2101 and ask for your free presentation diskette and the facts about data entry. Or. call our information operators 800-227-3800,

#### **Automatic Report Management And Distribution System**



- Multi-Function Menu Gets You There Faster
- On-Line Report Viewing Saves Paper
- PC Support Puts PCs To Work
- **Automatic Routing Speeds Report Distribution**



- Report Reruns
- Automatic Report Segmentation/Bundling
- MVS/XA, MVS/SP, MVS, OS/VS1, DOS/VSE

VIEWCOM	SAVE
T.	75% With VIEWCOM
	3

PHONE	IBM OPERATING SYSTEM	
CITY	STATE	ZIP
COMPANY	ADDRESS	
NAME	TITLE	
25-15 50th Street	twere Systems Inc. et, Woodside, New York 11377 (718) 204-2119	CW 6/2/86

review will provide a means for verifying development life cycle adher-ence and identifying violations, after which appropriate action may be

It may appear unnecessary to verify adherence to the systems development life cycle explicitly, for if there are no standards violations then the implication is obvious. But there is a potential benefit associated with verification: The outcome of a review should be balanced and objective, certainly identifying violations when present but commending with equal weight instances of development life cycle adherence. If this is known by the product developer beforehand, it will preclude feelings of defensiveness and hostility during the review.

If the sole purpose of a review was to bring to light a subject's

77

The purpose of verifying the efficacy of a systems development life cycle methodology goes beyond merely establishing that it works. The act of repeatedly reviewing the same methodology keeps one alert to alternative, and possibly better, ways of developing systems. Just because a particular method works does not mean it cannot be improved.

weaknesses or faults, then the review is apt to generate more of a negative atmosphere than a positive one. It might even create a sense of inferiority in a person where it should not legitimately exist.

No vehicle exists for updating a systems development life cycle

methodology to keep pace with technology, procedures, changing user expectations and so on. A systems development life cycle may fall into disuse very easily because it has become outdated, cumbersome or inappropriate. This results from not having a formal vehicle for updating

The First Picture-Oriented

Applications Generate and Prototyping Tool

ns all you need to instantly develop

the methodology with changes neces-

sary for survival. When a systems development methodology is found to be lacking or inapplicable for some reason for example, a technological or environmental change or a change in enduser expectations - most enterprising programmers and analysts will find a way around the problem. They only have the timely completion of their task in mind.

However, two things need to be done in this situation. First, the defi-ciency or inapplicable procedure within the systems development life cycle needs to be documented. Sec ond, the means, if any, by which the problem was circumvented needs to be recorded, for this could potentially be part or all of the recommendation to update the methodology.

The documenting of a problem within the systems development life cycle and the alternative procedure that was used in its place is another result of a product review.

Following that, the information should be passed on to the personnel responsible for investigating the cause of the systems development failure or incorrectness and formulating recommendations to resolve the problem.

No means exist for ensuring that a systems development life cycle methodology works. This is not strictly a condition that would cause a development methodology to assume a Category 3 status, for a methodology may be diligently applied and still not yield good results. What is required here is proof that a particular systems development methodology is as effective as it can be in terms of the quality of the applications that have used it.

Therefore, records need to be kept of the errors generated by these applications. The errors will need to be examined statistically for frequency and type. If trends are revealed, they should be a clue to which part of the development life cycle caused the errors.

The methodology is then modified to reduce the likelihood of the errors recurring, and another phase of recording and statistical reporting begins (see chart page 81).

The recording of errors produced by the application and the monitoring of error trends should be part of the testing phase of the systems development methodology and must also be continued for a mandatory period of time following system implementation - say, three to six months.

Care must be taken to attribute to the methodology only those errors that are genuinely the fault of a poor methodology, and not, for example, the fault of fluctuation in error trends that have been caused by hardware failure or inadequate operational procedures.

The purpose of verifying the effi-cacy of a systems development life cycle methodology goes beyond merely establishing that it works. The act of repeatedly reviewing the same methodology keeps one alert to alternative, and possibly better, ways of developing systems. Just be cause a particular method works does not mean it cannot be improved.

There is no visible management support of systems development life cycle. There is no fail-safe way to enforce a systems development methodology. The best methodology in the world will not necessarily

#### The VISUAL language of the future is here!

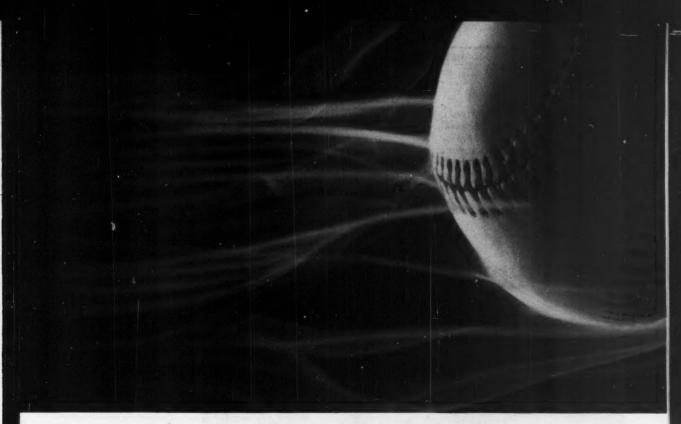


(SUFTWARE MERCHANTS) UNLIMITED OVERLAND AVE. SUITE 112

Tel: (213) 837-4456



Easy to use



THE FASTEST WAY.
TO MAINTAIN COBOL CODE.

# INTRODUCING FASTBOL.

When you're in the maintenance game, you're playing with your company's time and money. So you need the best help you can get. Which is why you should know about FASTBOL.™

FASTBOL speeds up COBOL renewal by giving you intelligence about the program from the program itself. Which makes information that took hours of effort to extract, available in seconds. On-line and in real time. And FASTBOL works within your VM and MVS editor environments, so you can make changes and check their effect immediately.

In addition, FASTBOL is easy to use and provides a lot of online help. Which means you'll be productive in hours, not weeks.

So if you're serious about beating the maintenance problem, you should take a serious look at a winner.

FASTBOL. It's in a league all by itself.

For more information on FASTBOL and a 30-day free trial, call 1-800-553-1200 or write to FASTBOL, One Jacob Way, Reading, Massachusetts 01867.

FASTBOL is a member of The Cobol Renewal Series."



77

The essential purpose of any tool is to enable accomplishment of a task with greater ease than could be done without that tool. Furthermore, for a tool to be effective, it must be used correctly and kept in working order. A systems development methodology is nothing more than a tool for the developers of application systems.

encourage or guarantee its application. Ultimately, it is the front-line programmers and analysts who will or will not apply the systems development methodology, and other than putting a gun to the head or promising a reward, what alternative is there to ensure the methodology is followed?

The answer has already been stated once: Given adequate time and means to do a good job, most people will do so without the need for additional coercion. And adequate time and means is probably the best form of management support that can be given. Its absence may easily be interpreted by DP staff as a clear signal that adhering to the systems development methodology is as of much — or little — consequence as not adhering to it.

Rather, the attitude should be one of shared concern. Management should endeavor to provide adequate time and means. They must remember that even though it is possible to pinpoint the culprits of systems development methodology violations, the repercussions of a low-quality product will be felt at their level as well.

Similarly, DP staff should be sympathetic to the fact that management is generally governed by deadlines and dollars. Therefore, the staff should endeavor to provide realistic resource estimates for applying the systems development methodology. Should there be limitations placed on them, then it is equally important that they apprise management of the consequences of not being able to follow the methodologv.

#### A simple tool

The essential purpose of any tool is to enable accomplishment of a task with greater ease than could be done without that tool. Furthermore, for a tool to be effective, it must be used correctly and kept in perfect working order.

A systems development life cycle methodology is nothing more than a tool for the developers of application systems. It must be applied correctly and scrutinized regularly to ensure it is still capable of its intended purpose. If end results or operating environments change. then the tool must be changed accordingly, remembering that minor modifications, although frequent, are preferable to major modifications of any frequency

In the context of data processing, there will always be a need for formal systems development life cycle methodologies. Certainly they are better suited to large business and scientific applications, which demand massive investments of time, money and human resources. But even small applications, if developed on a frequent basis, cannot ignore the safety of development via a repetitive and systematic process.

A systems development life cycle does not have to be a prolonged, multiphase methodology. It can be as simple as a three-, four- or five-step process, as long as the steps retain the same sequence and dependencies from one application to an-

other.

Neither fourth-generation languages — or fifth-generation ones, for that matter — nor the most sophisticated packaged software will make systems development life cycles redundant. There will always be a measurable distance in the path from concept to processed data. The simple but important point to remember is that a systems development life cycle is successful only if it works and keeps on working.

"BUT - I THOUGHT YOU WERE BRINGING THE MODEM ADS."



ctually, we know modems don't have much sex appeal. So this ad won't take much of your time.

Which makes it a lot like our 1200PA Modem. Which cuts the time you spend installing and supporting modems, because it's so easy to configure and reconfigure. You can set options from a terminal, from the unique LCD front panel, or

remotely via our Modem Manager™ feature.

The 1200PA is right for almost any situation (especially a changing situation)—with the most complete set of setup options in the business. Including MNP™ error control, speed matching and asynch dialing protocols.

Of course, it's Hayes® AT-compatible, too. In fact, it has everything you expect with a top-of-the-line 1200bps

modem—except a top-of-theline price.

Call us for more information and your free "I'd rather be reading modem ads" bumper-sticker, at 1-800-482-3427.



Racal-Vadic
1525 McCarthy Blvd./Milpitas, CA 95038

#### **NEW PRODUCTS**

# conversion of type, image

Datacopy Corp. of Mountain View, Calif., has announced the Datacopy Jetreader and Jetreader Plus scanning system, said to provide optical character recognition (OCR) and image processing capabilities.

The scanning system converts stacks of hard-copy data to disk files formatted for standard word processing software or to images for use in documents or data bases.

According to a company spokesman, the Jetreader image scanner offers selectable resolutions of 200 dot/in. or 300 dot/in. and an automatic paper feed. Scan times are approximately 43 seconds at 300 dot/ in. and 28 seconds at 200 dot/in.

The Jetreader comes with an interface to the IBM Personal Computer family and Datacopy's recently introduced OCR or OCR Plus software, along with its Word Image Processing System (WIPS). It accepts a stack of up to 10 sheets of legal-size

or smaller paper, the vendor said.
WIPS provides image scanner control, image manipulation, file management, image display and hard-copy output. It also allows integration of images into documents prepared on standard word processing software for display or printing. It costs \$695.

The OCR software is pretrained to read 12 standard office type styles and convert them into computer code for modification on word processing software. In addition to the standard type styles, the OCR Plus package can be trained by the user, using pattern technology, to recognize virtually any 10- or 12-pitch monospace type style.

The OCR software runs on any IBM Personal Computer or compatible and operates with Datacopy's Model 700 and 730 platen scanners and its other document scanners. OCR and OCR Plus are priced at \$695 and \$995, respectively.

Jetreader, including OCR software, sells for \$2,950. Jetreader Plus, including OCR Plus software, costs \$3,250.

#### System offers | Lee Data unveils terminal

#### Viewed as replacement for interactive IBM 3178 model

The Phaze Terminal Division of Lee Data Corp. in Minneapolis has announced the Model 1178 display, a plug-compatible replacement for the IBM 3178 interactive terminal.

According to the vendor, the Model 1178 has a 14-in. screen and operates with all models of IBM controllers for largescale computer connectivity.

The compact terminal is said to be suited for interactive inquiry, data retrieval, record modification and program development tasks.

The footprint of the Model 1178 measures 101/2 by 11 in., and the display is said to weigh 23 pounds.

The ergonomic design features a tiltand-swivel monitor, a detached, low-pro-file keyboard in four layout styles and an optional amber screen. It also features a key lock for added security, a company spokesman stated.

The Model 1178 is priced at \$995 on a



Lee Data Corp. Model 1178 display

single-unit basis and \$796 in quantities of 100. Larger quantity discounts are also available.

Other products of the Phaze Terminal Division of Lee Data include the P3278 monochrome terminal and the P3279 color

#### INSIDE

Software & Services/88

Microcomputers/91

Communications/99

Systems & Peripherals/105

Reductions/113

#### Secure net debuts for micro users

The Federal Systems Division of Grid Systems Corp. of Vienna, Va., has introduced a Distributed Secure Information Network (DSIN) for laptop micro users. The network was designed to meet military and intelligence agency requirements for mobile and secure micro communications. The network also will be available for commercial sales.

The DSIN allows local or remote users to communicate with one another via fiberoptic cables, phone lines or satellite links using a recently released software package called Gridmail, a company spokesman said.

According to the spokesman, Gridmail ties all of the users and computers together. It permits the mobile users to continue to communicate even though they are continuously on the move

DSIN will allow mobile users to communicate to other temporary or fixed locations and will allow users to be assured that all data is securely and correctly received, the vendor said. All of the products were designed to meet the Tempest security standard of the U.S. Department of Defense to prevent leaks of sensitive data.

The Tempest Gridcase (Model 1307), an extension of the Grid line of IBM-compatible laptops, will cost \$11,250. The Gridserver (Model 1727) will sell for \$24,695.

All of the products will be available in late summer, the vendor said.

#### Speech transcriber announced

#### Features 1,000-word vocabulary recognition

At the recent Speechtech '86 speech technology conference, Dragon Systems, Inc. of Newton, Mass., announced Voicescribe-1000, automatic dictation transcription

Voicescribe-1000 has a 1,000-word active vocabulary speech recognition capability. According to the vendor, it runs near real time on a personal computer with an 8-MHz Intel Corp. 80286 processor.

Although intended as a large-vo-

cabulary artificial language recognition system, Voicescribe-1000 is also said to be capable of limited natural language recognition tasks. Voicescribe-1000 can be used for

dictation of informal notes and docu-

ments with a limited vocabulary or repeated phrases.

Reportedly, the vocabulary is easy to customize, so the transcription system can be used for applications in which many letters are written on the same subject, such as sales let-

Voicescribe-1000 is priced at \$995. It includes an IBM Personal Computer XT- or AT-compatible peripheral board, the Voicescribe-1000 recognition software, user documentation and the Dragonkey voice-activated keyboard utility software.

The minimum system configura-tion is any IBM PC or compatible with 256K bytes of random-access memory (RAM) and a hard disk. To use the full 1,000-word vocabulary capacity, the user must have a per sonal computer with an 8-MHz 80286 processor and 640K bytes of RAM, the vendor said.

#### **Graphics library allows Turbo Pascal** to run under IBM, Hercules standards

The University of California at Berkeley Campus Software Office developed Turbo Graphic Tools, a transportable graphics library for Borland International, Inc.'s Turbo Pascal program.

Turbo Graphics Tools is a library of graphics primitives which, according to the vendor, overcomes the hardware differences of the Hercu-les, IBM Color Graphics Adapter (CGA) and IBM Enhanced Graphics Adapter (EGA) standards.

The Hercules Graphics Adapter offers a resolution of 720 by 348 pixels and two colors; the IBM CGA offers 640- by 200-pixel resolution and two colors; and the IBM EGA offers a resolution of 640 by 350 pixels and 16

According to a spokeswoman from University of California at Berkeley,

Turbo Graphics Tools was designed for programmers who wish to write transportable Turbo Pascal graphics programs capable of running under both the IBM and the Hercules graphics standards. The same compiled code is said to run on any of the three adapters.

According to the spokeswoman. the library resides in less than 12K bytes of memory and runs on any IBM Personal Computer with Turbo Pascal.

The software determines the hardware configuration and selects the graphics mode offering the highest resolution and most colors.

Turbo Graphic Tools is available from the University of California at Berkeley Campus Software Office for \$100. All source code and documentation are included.

# TODAY IS THE IN DOT MATRIX

It would pay you to mark it on your calendar.

Because today is the day we introduce our new Pinwriter P5XL dot matrix printer. The only dot matrix printer available capable of producing the crisp, black printing you associate with a letter-quality printer. Because it's the only one designed to use not just a fabric ribbon, but a letter-quality multistrike film ribbon—the same ribbon used in typewriters and letter-quality printers.

A LITTLE BLACK MAGIC.

Actual line printed with the Pinwriter P5XL printer.

It's only natural that the first dot matrix printer with true letter-quality printing should be an NEC. After all we make Spinwriter letter-quality printers, the most popular line today, as well as the Pinwriter P5 series dot matrix printers, the most advanced and extensive family of 24-pin printers available.

Black letter-quality printing is not the only thing our Pinwriter P5XL can do. It can also use an optional ribbon to print seven other colors. And it has the finest graphics resolution of any impact printer available. So charts and drawings are much more vivid. Plus it's very fast, extremely quiet and can use an array of type faces. And it's designed and built to have the reliability that has made NEC printers legendary.

# BLACKEST DAY PRINTER HISTORY.

Now for all the exclusive features we managed to pack into the Pinwriter P5XL, you'll find it only costs about the same as other top 24-pin dot matrix printers.

The Pinwriter P5XL printer is the newest addition to the only 24-pin printer line that has a model designed to fit every need and budget. See them at your dealer or for more information call 1-800-343-4418 (in MA 617-264-8635). Or write: NEC Informa-

418 (in MA 617-264-8635). Or write: NEC Information Systems, Dept. 1610, 1414 Massachusetts Ave., Boxborough, MA 01719.

NEC PRINTERS. THEY ONLY STOP WHEN YOU WANT THEM TO.



#### **NEW PRODUCTS/SOFTWARE & SERVICES**

#### SOFTWARE & SERVICES

#### Systems software

Honeywell, Inc. has announced that its CP-6 operating system is available on its DPS 90 information processing system.

According to the vendor, CP-6 on the DPS 90 is intended for engineering and scientific applications, such as finite element analysis or solids modeling. It allows users to take advantage of the DPS 90 Integrated Vector Processing without requiring special coding techniques.

CP-6 features time-sharing, batch processing and transaction process-

Prices start at \$20,000 per month.

Honeywell Manufacturing Systems Division, 2222 W. Peoria Ave.,
Phoenix, Ariz. 85029.

Century Analysis, Inc. has ported Star, its combined office and data system, to the NCR Corp. 9800 computer.

The Star system includes a set of integrated office tools for interuser communication, personal information manipulation and desk organization as well as multiuser data storage and retrieval and capabilities for interpretive development.

Star includes a networked office processing subsystem, a fourth-generation development language, a relational data base management system, a management query language and utilities.

Star is priced from \$10,000. Century Analysis, 114 Center Ave., Pacheco, Calif. 94553.

Graphic Software Systems, Inc. has announced that its GSS-GKS graphical kernel system development package is available for the IBM RT Personal Computer.

According to the vendor, GSS-GKS enables the user to port mainframe, mini and microcomputer graphics applications to RT PC systems. It also allows Microsoft Corp. MS-DOS- or IBM PC-DOS-based personal computers to connect to the RT PC as intelligent graphics workstations.

GSS-GKS supports two standard metafile formats, the GKS Metafile and the Virtual Device Metafile.

GSS-GKS costs \$795. Graphic Software Systems, 9590 SW Gemini Drive, Beaverton, Ore. 97005.

#### Applications packages

Computer Associates International, Inc. has added the CA-Fund Accounting System to its Advanced Business Software series of financial management applications for IBM's DOS/VSE and MVS operating sys-

The system was designed for public and nonprofit organizations. It provides general ledger, purchasing and accounts payable fund management capabilities.

The Advanced Business Software series is on-line and integrated. It is said to provide real-time updating.

The CA-Fund Accounting System is priced at \$213,000 for the DOS/VSE environment and \$256,500 for the MVS environment.

Computer Associates, 711 Stewart

Ave., Garden City, N.Y. 11530.

Access Technology, Inc. has announced Version 1.1 of its 20/20 integrated spreadsheet for Prime Computer, Inc. systems running Primos 19.4 or higher.

Version 1.1 reportedly offers support for PT 200 and Visual 550 graphics terminals and the Hewlett-Packard Co. HP7550 eight-pen plotter. It also offers increased print spooling options support.

spooling options support.

Other enhancements include the ability to nest command procedures and an expanded model link or consolidated capability.

The spreadsheet costs from \$500 to \$15,000.

Access Technology, Six Pleasant St., S. Natick, Mass. 01760.

#### Languages

Language Processors, Inc. has ported its LPI-RPG II compiler to the AT&T Information Systems 3B family running under AT&T Unix System V

According to the vendor, it features a high-performance optimizer, an interactive source-level debugger and cross-language calling, which enables programmers to employ multiple LPI languages in a single application.

LPI-RPG II is compatible with IBM System/34 computers.

End users are said to be able to port existing RPG-II applications to an AT&T system. The LPI-RPG II compiler is priced

The LPI-RPG II compiler is priced at \$3,000 for the 3B2 and \$5,000 for the 3B5.

Language Processors, 400-1 Totten

Pond Road, Waltham, Mass, 02154.

Hewlett-Packard Co. has introduced a validated Ada compiler for use on its HP 9000 Series 200 and 300 technical workstations.

The compiler runs under HP-UX, which adheres to AT&T's System V Interface Definition Issue I and provides access to all HP-UX system services and utilities.

In addition to Ada program development, HP-UX provides an environment for program development in Fortran, Pascal, C, 680XO Assembly, Common LISP and Technical Basic.

The Ada compiler costs \$3,125 for the single-user version and \$4,275 for the multiuser version.

HP, 3000 Hanover St., Palo Alto, Calif. 94304.

## NOW IBM PROFS USERS



#### **NEW PRODUCTS/SOFTWARE & SERVICES**

Zeta Soft, Ltd. has announced Release 1.1 of Zeta-C, a C compiler and development environment for Symbolics, Inc.'s 3600 series LISP machines.

According to the vendor, Zeta-C 1.1 is an implementation of industry standard C. It is compatible with the AT&T Unix System V compiler as well as the University of California at Berkeley Unix 4.2 compiler.

Features of the product include incremental compilation, runtime bounds checking on array and pointer references and an interactive Csyntax debugger.

Zeta-C Release 1.1 includes a user's guide and six months of support. It costs \$5,800 for the initial CPU

It costs \$5,800 for the initial CPU license plus \$1,000 for each additional CPU at the site. Zeta Soft, P.O. Box 139, 94 Sciar-

Zeta Soft, P.O. Box 139, 94 Sciar appa #2, Cambridge, Mass. 02141.

#### Utilities

Compinfo, Inc. has announced Findit, a software utility for the Wang Laboratories, Inc. Wang VS series of computers.

Findit is said to allow users to find any file or library in a system.

The utility features wild card characters that reportedly enable users to find any part of a name including leading characters, trailing characters, embedded characters or a combination.

Findit integrates with six other Compinfo modules for functions such as reorganizing index files and copying multiple files.

The Findit system is priced from \$300 to \$500 depending on the utility functions purchased.

functions purchased.

Compinfo, 381 Park Ave. S., New York, N.Y. 10016.

Sterling Software, Inc.'s Dylakor Division has introduced a DOS/VSE version of the Interface between its DYL-280 and DYL-280 II information management products and Cullinet Software, Inc.'s IDMS/R data base.

The module utilizes statements predominant in the IDMS/R Cobol Data Manipulation Language and supports all IDMS/R verbs, according to the vendor.

Users can retrieve and update conventional records, Logical Record Facility records and IDMS/R table entries from IDMS/R data bases.

Access to IDMS/R integrated data dictionaries is also provided, the vendor said.

The DOS/VSE version of the interface is priced at \$8,690 for customers who already own DYL-280 or DYL-280 II.

Sterling Software, Dylakor Divi-

sion, 17418 Chatsworth St., Granada Hills, Calif. 91344.

Integrated Virtual Systems has announced Release 2.0 of its CL-1 productivity series package for Elxsi Co. System 6400 computers using EMBOS SR-11.

The package is said to allow Digital Equipment Corp. VMS and Apollo Computer, Inc. Aegis users to become productive in the Elxsi System 6400 environment.

CL-1 features file handling functions such as listing directories and copying files, hierarchical menu processing and support for electronic mail, remote printing and plotting and implementation of remote job submittal.

CL-1 is priced at \$5,000.

Integrated Virtual Systems, 46627 Paseo Padre Pkwy., Fremont, Calif.

Advanced Technology Center has announced Grafpak-CGM, computer graphics metafiles available as Grafpak-GKS workstation modules.

According to the vendor, Grafpak-Graf

Grafpak conforms to the binary, character and clear text encoding formats of the ANSI/ISO Computer Graphics Metafile standard.

Grafpak-CGM costs \$2,500. The personal computer version costs \$500.

Advanced Technology Center, Suite 238, 5711 Slauson Ave., Culver City, Calif. 90230.

#### Data base management systems

Tom Software, Inc. has announced Release 5.0 of its Speed II fourth-generation productivity tool and integrated data base management system.

Added features include a substring search, added memory files, enhanced application navigation and the ability to create, modify or delete records in a related master file without leaving the current function.

Speed II is said to integrate with Wang Laboratories, Inc. products, including Decision Support Software and Wang Office.

Speed II is priced from \$10,000.
Tom Software, P.O. Box 66596,
127 S.W. 156th, Seattle, Wash.
98166.

#### Services

Electronic Catalog, Inc. has introduced Electronic Catalog, an on-line service said to provide information on microcomputer manufacturers, distributors, products and pricing.

The system is menu-driven and includes a Help facility. Features of the service include searches and listings of product families, functionalities, emulations and product clones.

The standard price of the service is \$50 per hour with a minimum of one hour per month.

Electronic Catalog, 317 E. San Rafael, Colorado Springs, Colo. 80903.

# CAN COMMUNICATE WITH THE WORLD.

#### INTRODUCING MCI MAIL LINK TO PROFS.

While PROFS™ has always been great at letting people in your company talk to each other, communicating with the outside world was impossible.

Until now.

Now there's MCI Mail Link" to PROFS. MCI Mail Link lets you use PROFS to communicate to anyone, anytime, anywhere—outside your PROFS network. From business partners to business prospects, all over the world.

So now you can send PROFS Notes and Final Documents to lots of people,



lots of ways. Send postal mail with your letterhead and signature. Telex messages around the world. Even send electronic messages to users of other mail systems.

And expanding your PROFS communications capabilities won't cost you the world. You don't have to build a network... just plug into ours. The software is easy to install. There's no new equipment to buy. No costly retraining. In fact, MCI Mail® will save you money every time you use it.

Take the first step in reaching the world. Call MCI Mail for more information at 800-MCI-2255. In Washington, DC, call 833-8484. And instantly you'll start turning your isolated PROFS network into a global communications network.

MCI

© 1986 MCI Communications Corp. MCI Mail Link nofeware that connects PMINES to MCI Mail developed by Self-Switch Incorporated.

1894 is a registered trademark and PROPS in trademark of international Business Machines Corp. MCI Mail is a registered trademark and MCI Mol Link is a trademark of MCI Communications Corp.

## ONE COMPANY,

there's a lot more to data communication than jest huying equipment or services from a vender. That's exactly why you need Transet.

Unifice every/sody also, we're not simply a date communications supplier, bashood of help at the farefrent of ecty one tody as help as

everything from politicas private as two first to enter and think to decide fine the soft of the soft

Roling on Industry is a device it any thing to be far frymmet. We've bean the banker in late explored this has for more than 15 years. And more, or just of the Medewigh beingles indermeter Systems Group, or selections are soon more for magazing.

for more information about the broudth industries of Tymnet's coming, all or arrive to law.

ther recovered into make the most of yourse Tyroned 27 to Greater's Partnersy San Jose, CA 95124

TYMNET VCDONNELL DOUGLAS

#### **MICROCOMPUTERS**

#### Software applications packages

Harris/Lanier Business Products, Inc. has introduced Harrisdesk, a word processing package for personal computers.

Harrisdesk is said to feature the vendor's Perspective user interface. Task and Speller. It can be run in a multiuser configuration via the Concept 4300 personal computer work group server or as a stand-alone product on the Harris 2000 Personal Computer or any IBM-compatible personal computer.

The Speller function uses a 90,000 word dictionary and a 6,500 word user-definable dictionary to verify spelling. Task allows users to write programs for frequently performed tasks.

Harrisdesk costs \$695.

Harris/Lanier, 1700 Chantilly Drive N.E., Atlanta, Ga. 30324.

Lowell Systems, Inc. has announced Time-Trak L3000, a time and attendance package for Microsoft Corp. MS-DOS-based systems.

Time-Trak L3000 is said to generate management reports including daily absentee and tardy rolls, payroll and daily cost per work center.

It includes a module for productivity monitoring that tracks time spent by each employee on specific jobs and is capable of host communica-

tions for internal financial functions.

The system uses slot readers, function keys and a variety of scanning devices. Each employee is issued a bar-coded ID badge.

bar-coded ID badge.
Time-Trak L3000 is priced from \$12,000.

Lowell Systems, 140 Industrial Ave. E., Lowell, Mass. 01852.

Academic Press, Inc. has announced Graph-Pad, software said to produce graphs of scientific data.

The program offers flexible data entry, data manipulation and plotting. Users can enter data from exising graphs, type onto a built-in spreadsheet, read disk files created by Graph-Pad, Lotus Development Corp.'s 1-2-3 and other programs and save data on a diskette.

Other features include the ability to average replicate values, calculate and plot error bars, mathematically transform data, calculate linear regression and plot the best-fit line.

Graph-Pad runs on an IBM Personal Computer or compatible. It costs \$340.

Academic Press, Orlando, Fla. 32887.

#### Software languages

Ryan-McFarland Corp. and AT&T have announced Unix versions of RM/Fortran and RM/Cobol for the AT&T Personal Computer 6300 Plus.

RM/Fortran is a complete implementation of the Fortran 77 standard. The AT&T Unix System V im-

plementation executes the same source code developed for Microsoft Corp. MS-DOS and IBM PC-DOS implementations.

According to the vendor, RM/Fortran applications run faster on the Intel Corp. 80286-based PC 6300 Plus than on the Intel 8088-based PC.

RM/Cobol is an ANSI 74 Cobol implementation.

The products are priced at \$805

The products are priced at \$895 each.

Ryan-McFarland, 609 Deep Valley Drive, Rolling Hills Estates, Calif. 90274.

#### Software utilities

Pro-Log Corp. has announced the STD LIB 1.1, a software library of initialization and driver routines said to allow application programs written in Basic, C.or assembly language to link to STD Bus I/O cards.

The library supports the vendor's STD DOS system. It provides complete hardware initialization and I/O routines and consists of modules written in assembly language. Each module includes a set of routines related to a single I/O card or a family of cards. The library is delivered on two 5¼-in. IBM Personal Computer-compatible diskettes and comes with a manual.

STD LIB 1.1 costs \$295. Pro-Log, 2560 Garden Road, Monterey, Calif. 93940.

FEL Computing has unveiled Release 2.0 of the Mobius micro-to-host

integration system.

Mobius is said to allow transparent interaction between Digital Equipment Corp. hosts and a variety of microcomputers. Features of Release 2.0 include task-to-task communication, enhanced DEC VT100 emulation, a task definition facility and the ability to define as many as 26 micro disk drives on the host system and assign each a descriptive volume label.

The price for a system supporting up to five simultaneous users is \$3,500 for the host and \$250 each for the microcomputers.

FEL Computing, P.O. Box 72, 10 Main Street, Williamsville, Vt. 05362.

#### Software enhancements

Micrografx, Inc. has released In-a-Vision Version 1.2, an upgrade of its computer-aided design program for the IBM Personal Computer and compatibles.

Enhancements include command execution during redraw, an add window command, smaller dialogue boxes, an align command and simpler pie and elliptical arc creation.

Version 1.2 is available to registered users for \$49.

Micrografx, 1820 N. Greenville, Richardson, Texas 75081.

Applied Business Technology Corp. has announced Project Workbench Release 2.2, an enhanced version of its project management soft-Continued on page 92

# RMA.KLONE. \$595. FULL FUNCTION. HALF PRICE

# KLONE is a low cost, generic replacement for Irma, the micro to mainframe link for IBM 3270 users. KLONE includes all hardware and full emulation software. Any and all programs that support IRLONE. Configured and programmed from floppy disk, KLONE allows enhancements and upgrades without changing ROMs or disassembling the PC. KLONE is manufactured and backed by Agile, a company with over 8 years experience in IBM product emulation.

#### 30 DAY FREE TRIAL

KLONE is being offered to you at no risk. If after 30 days use you are not 100% satisfied with KLONE's performance, you may return it at no charge. Call now for info.

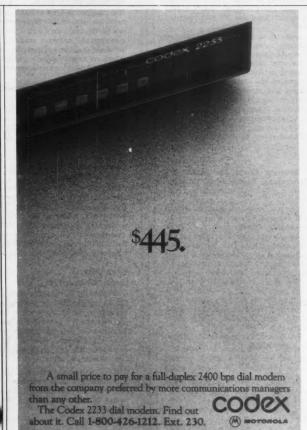
#### 800-538-1634

(Inside CA, call collect 415-825-9220)

AGILE
4041 Pike Lane, Concord, CA 94520



Irms is a trademark of Digital Communicatione Associates, Inc. NLDNE is a trademark of AGILE



rols, Inc. Codex is a regi

Continued from page 91

ware package for IBM Personal Computers and compatibles.

Release 2.2 includes local-area network support, subproject capability, expanded scheduling and reporting capabilities, an expanded dependency network, expanded user interfaces and support for additional hardware, including plotters.

Project Workbench Release 2.2, including manual and on-line tutorial, costs \$1,150. There is an optional annual maintenance fee of \$250. Applied Business Technology, 6th

Applied Business Technology, 6th Floor, 365 Broadway, New York, N.Y. 10013.

**Profidex Corp.** has released **Revision 2.2** of its sales and marketing software package **Scamp**.

Scamp is said to support telemarketing, direct mail and field sales. It is available for all Data General Corp. multiuser computer systems as well the IBM Personal Computer family and compatibles.

Scamp provides data retrieval and update, management reporting options, data import and electronic lead distribution features, autodialer interface, automatic mail merge file production and six levels of security. It costs \$695 for microcomputers

and starts at \$3,000 for DG minis.
Profidex, 90 West St., New York,

N.Y. 10006.

#### Communications

Questronics, Inc. has announced Analycon, a data communications performance analyzer for the IBM Personal Computer XT and compatibles.

According to the vendor, Analycon controls a set of Questronics' Multi-Line Analyzer Systems, up to 255 lines, and data base information regarding network performance. It coordinates the data collection, data basing and reporting of information and provides statistical reports and graphical presentations.

Analycon costs \$3,495. Questronics, 3570 S.W. Temple, Salt Lake City, Utah 84115.

Braegen Corp. has added PC Networking Products to its Elan System of IBM 3270-compatible products.

The line is said to allow networked IBM Personal Computers to directly access IBM mainframe channels via a single coaxial cable. The products are compatible with IBM's Netbios standard and run under IBM's PC Network Control Program or Novell Inc.'s Advanced Netware.

The series includes the Elan Network Adapter Card, priced at \$1,295; the Elan Server Adapter for the IBM Personal Computer AT, priced at \$2,495; and the Elan File Server, priced at \$17,995.

Braegen, 525 Los Coches St., Milpitas, Calif. 95035.

Gateway Communications, Inc. has announced the Wide-Area Network Interface Module 186 (WNIM-186), a coprocessor option board for IBM Personal Computers.

The board supports communications speeds up to 800K bit/sec. It also supports various data transmis-

sion techniques including asynchronous, bisynchronous, CCITT X.25 and Systems Network Architecture/Synchronous Data Link Control.

The board costs \$695 with 128K bytes of memory and \$795 with 512K bytes.

Gateway Communications, 16782 Red Hill Ave., Irvine, Calif. 92714.

#### **Data storage**

Syquest Technology has announced the SQ1500 family of integrated, removable hard disk subsystems for IBM Personal Computer XTs, ATs and compatibles.

Four models are available with single or dual removable drives or in a fixed drive/removable drive combination. A subsystem chassis houses two drives providing up to 90M bytes of fixed and removable on-line data

storage. Data transfer rates are 7.5M bit/sec.

Prices for the subsystems range from \$2,499 to \$3,695.

Syquest Technology, 47923 Warm Springs Blvd., Fremont, Calif. 94539.

Vero Electronics, Inc. has announced the 451 48055, 3U form factor and the 452 48056, 6U form factor, two modules said to provide VMEbus-compatible 1M-byte dynamic random-access memories.

The modules feature 24-bit addressing with flexible address modifier decoding, addressability on any 64-byte boundary within the 16M-byte space, byte parity error detection and eight- or 16-bit data transfers

The 451 48055 costs \$899, and the

452 48056 costs \$899.

Vero Electronics, 40 Lindeman Drive, Trumbull, Conn. 06611.

Optotech, Inc. has introduced a write-once optical storage system said to support the small computer systems interface (SCSI).

The storage system reportedly includes a 200M-byte-per-side disk drive, controller and software tools. The SCSI storage system is built around the Model 5984 write-once, read-only optical disk drive that provides a data transfer rate of 2.2M bit/sec.

The SCSI system drives are priced from \$975 to \$3,400 and the controllers from \$350 to \$650.

Optotech, 770 Wooten Road, Colorado Springs, Colo. 80905.

#### **Learn to Build and**

#### Attend the Network Management/Technical

June 9-12, 1986 World Trade Center, Boston

#### NM/TC is a highly focused, technical conference.

It is designed to brief network managers and technical control personnel on the latest products, services, concepts and software available to solve the problems of complex networks in today's rapidly changing telecommunications environment.

#### NM/TC is a must for network managers.

The conference offers useful and tothe-point help in coping with a variety of management and technical issues from planning to SNA networks.

#### Conference Program — June 11th and 12th

The NM/TC conference offers a special opportunity for network managers, with hard-hitting and professional presentations. NM/TC is specifically designed for those managers who must operate at two levels - both managerial and technical. Forty sessions are offered.

#### Exposition — June 11th and 12th

The exhibits will display state-ofthe-art equipment from the leading vendors in the industry where you can personally examine the next generation of network control centers, management systems, modems, multiplexers, diagnostic and test systems, and more.

NM/TC sponsoring exhibitors play a prominent role in the show — Avant-Garde Computing, Datacomm Management Sciences, and Racal-Milgo.



#### Exhibitors -

Atlantic Research, Connections Telecommunications, Digilog, Digital Communications, Digitech Industries, INFINET, Infotron Systems, NCR Comten, Network World, Northern Telecom/Spectron, TP+P, Telenex, Telephony, Venator Systems, Versa-Lite Systems, Wandel & Goltermann.



Keynote Speaker: Richard J. Holleman Director of Standards Practices, IBM Corp.

#### Featured Session:

Top Vendors of 1990 Will Zachmann Chairman VP/Research, IDC

#### In-Depth Tutorials — June 9th and 10th

Industry experts will instruct fullday courses on network control, IBM/SNA network management systems, strategic planning and network diagnostics.

#### Monday, June 9, 1986

9:00 am - 5:00 pm Select One

T-1 Fundamentals of Network Control Gabriel Kasperek, President, Kazcom, Inc. The basics of network control, including problem diagnosis and repair, maintenance and operational issues.

Integrated Voice/
Data Corporate Networks
Roshan Lal Sharma, Sr. Scientist/
Consultant, Telecommunications
Network Science.

Network topologies and their synthesis, costeffective network planning, future trends in intelligent networks and their impact on network management and control.

Cost Efficient Methods for implementing New Tariffs Cheryl A. Cushing, Manager, Reference Services, Connections

Telecommunications, Inc.
Post-divestiture tailfrules, including LATAs
and POPs with a comparison of major common-carrier tariffs, and evaluation of intraLATA access alternatives and a review of
new regulatory alternatives to traditional network costs.

T-4 ISDN I
Samuel Lynch, Senior Consultant,
Zatyko Associates.
Definition and concepts, application standards and world-wide status rules comparing

dards and world-wide status, plus comparison of ISDN against OSI Reference Model as standard.

T-5 System Network Architecture 1

T-5 System Network Architecture I
Thomas Routt, Senior Consultant,
Zatyko Associates.
Current status of IBM's communication ar-

chitecture, new extensions such as LU 6.2/APPC and NETBIOS and IBM LANs as "defacto" standards.

#### Printers/Plotters/Peripherals

Panasonic Industrial Co. has unveiled three IBM-compatible monitors for graphics and text displays featuring 80-line by 25-char. screens.

TR-125M9T monochrome monitor offers 640- by 640-pixel resolution and displays 16 shades; a two-shade text mode offers 720- by 350- pixel resolution, and an alternate text mode offers 640- by 350pixel resolution.

Model C-1310 is a 13-in. red-green blue (RGB) monitor that displays 16 colors with 640- by 200-pixel resolu-

Model C-1350 is a 13-in. RGB monitor that displays 16 shades of 64 colors. It offers either 640- by 200- or 640- by 350-pixel resolution.

Prices for Models TR-125M9T, C-1310 and C-1350 are \$199, \$599 and \$699, respectively.

Panasonic, One Panasonic Way, Secaucus, N.J. 07094.

Ziyad, Inc. has announced the Paperjet 400, a dual-sheet and envelope feeder.

The Paperjet 400 is said to automatically feed letter, 13-in. legal, 14in. legal, monarch and European DIN A-size paper.

Users can store up to three different kinds of stationery at the same time, according to the vendor.

The Paperjet 400 is available for laser printers including the Wang Laboratories, Inc. LPS8, the Hewlett-Packard Co. Laserjet and Laserjet Plus and Canon, Inc. LPB-8 printers. It costs \$1,895.

Ziyad, 100 Ford Road, Denville,

N.J. 07834.

Zivad. Inc. has announced the Paperjet 2000, an office print station.

The Paperjet 2000 features a letter-quality printer, cut-sheet paper and envelope feeder and accoustical sound hood.

It is said to print at more than 63 char./sec. and has both serial and parallel connector ports to connect with various hosts.

According to the vendor, the printer can also emulate printers including the Qume Corp. Sprint II, Diablo Systems, Inc. 630 and NEC Corp.

The Paperjet 2000 is priced at \$44,495.

Ziyad, 100 Ford Road, Denville, N.J. 07834.

Thomson Consumer Products has announced VM3801DA/DG 15-in. monochrome monitor, said to support 132-col. displays and transform color signals into 16 shades of amber or green.

The monitor features a dual-scan monitor and operates at both 15.7 kHz and 18.4 kHz. It has a built-in D-9 connector, so it can be plugged into both monochrome and color graphics

The VM3801DG with a green dis-play costs \$239. The VM3801DA with an amber display costs \$249.

Thomson Consumer Products, #111, 5731 W. Slauson Ave., Culver City, Calif. 90230.

PC's Limited has announced a monitor, said to support enhanced graphics with up to 64 colors at 720by 350-pixel resolution, and Egads, an enhanced graphics adapter.

The 13-in. monitor is also said to support standard color or graphics cards with 16 colors. The text mode allows switching to green for word processing.

Egads is said to support both color and monochrome displays. It comes with a light-pen interface. The card features a 256K-byte bit-mapped graphics buffer and a random-access memory-loadable character genera-

The monitor costs \$479, and Egads costs \$269.

PC's Limited, Building Three, 1611 Headway Circle, Austin,

Softcorp, Inc. has enhanced its Sidestep horizontal printing program for IBM Personal Computers and compatibles and dot matrix printers.

Sidestep is said to rotate an entire document 90 degrees. It includes improved font files that enable it to print more of the extended ASCII character set than before.
Sidestep costs \$60. Registered

Sidestep users can upgrade for \$10. Softcorp, Suite 244, 2340 State

Road 580, Clearwater, Fla. 33575.

Fujitsu America, Inc. Peripheral Products Division has announced that the IBM Proprinter command set is available for its Model DX2100 and DX2200 dot matrix printers.

According to the company, the command set is available on a single personality card that is switch-selectable between IBM Proprinter and IBM graphics printer commands.

The IBM Proprinter command set including an 8K-byte buffer costs

Fujitsu America, 3055 Orchard Drive, San Jose, Calif. 95134.

Panasonic Industrial Co. has announced the KX-P1080AP dot matrix printer, said to be compatible with Apple Computer, Inc.'s Macintosh and Apple IIC.

The printer has a built-in RS-232C adapter. It prints near-letter quality in all pitches at 24 char./sec. and draft quality at 90 char./sec.

The KX-P1080AP costs \$379. Panasonic, One Panasonic Way, Secaucus, N.J. 07094.

### **Control Your Network**

#### Control Conference and Exposition





Daniel Zatyko, President.

Current status of IBM's communication ar-

chitecture, including applications and stan-dards, and development of X.25 up to 1988

T-7 MAP/TOP Systems Interconnection Donald Harring, Vice Presiden Zatyko Associates

Status of seven layer OSI Reference Model as

framework for future network compatibility, review of major vendor architecture - IBM,

DEC, etc; migration to manufacturing auto-mation and office communication protocols.

Tuesday, June 10, 1986

9:00 am - 5:00 pm

Select One

T-8 Planning the Network Control Center Gabriel Kasperek, President, Kazcom, Inc. User considerations in the design, equipment selection, software, and instrumentation of a network control center and related vendor is-











lanagement in SNA Networks Fred Cook, Senior Consultant Techniques useful in analyzing problems in SNA networks. Topics include detailed SNA sequences, VTAM trace, NCCF, NPDA, NLDM and a review of critical parameters in

NCP System Generation T-10 Network Modeling/ Design Workshop Larry Rhue, Vice President, Connections Telecommunications Inc. Network design calculations using MNDS

PC-based design software and the compli-mentary Borland SIDEKICK package. Also included, queuing calculations in simple and complex network models, reflecting SDLC, BSC and X.25 protocols, statistical multi-plexers and distributed concentrator net-

Samuel Lynch, Senior Consultant,
Zatyko Associates.
Technology and system/network/switching of ISDN, and certification and network testing, including 1986/87 field trials/user implementation.

Thomas Routt, Senior Consultant, Zatyko Associates. Technology and systems impact of SNA and

relation to open architectures and protocols on networks from DEC and other vendors, and higher layer SNA services - DIA/DCA. er layer SNA services - DIA/DCA,

Public/Private Data Network II Daniel Zatyko, President, Zatyko Associates

Technology and systems impact of long distance, regional and in-house data networks, including message handling systems and of-fice document interchange formats under different operating systems

MAP/TOP System Donald Harring, Vice President,

Zatyko Associates.
Session will cover MAP/TOP common protocol connectivity, GM and Boeing programs, other vendor demos, user experiences and the implications of Corporation for Open Systems on MAP/TOP, vendor stan-

You can't afford to miss NM/TC, the most comprehensive technical show of its kind held at the World Trade Center, Boston's high tech showplace.

To register, please fill out the coupon below and send it to NM/TC, Box 9171, Framingham, MA 01701-9171 or call us at (800) 225-4698 or (617) 879-0700

<b>Network Management/Technical Control Conference</b>	& Exposition
Box 9171, Framingham, MA 01701-9171	

☐ YES, please register me for NM/TC at the World Trade Center, Commonwealth Pier, Boston. Please type or print: ☐ One-day Conference & Expo (includes lunch) . . . . . \$100.00 Check one: ☐ Wednesday, June 11 ☐ Thursday, June 12 ☐ Two-day Conference & Expo (includes lunch) . . . . . \$195.00 June 11-12 "In-Depth" All-Day Tutorials. Advanced registration Street, P.O. Box Monday, June 9 (includes lunch) . . . . . . . . \$295.00 City, State, Zip ☐ Tuesday, June 10 (includes lunch) . . . . . . . . \$295.00 Credit card billing is available. Call (800) 225-4698 or (617) 879-0700. Registrations canceled later than May 30th are subject to a \$50.00 service charge. Registrations may be transferred at no charge. NM/TC is brought to you by the Communication Networks show team and is managed by CW/Conference Management Group, a division of CW Communications/Inc., publis Computerworld and Network Harld.

Houston Instrument has introduced the multipen PC Plotter.
The PC Plotter features a four-pen

carousel and plots on paper, vellum or overhead transparencies. The plotter contains Houston Instrument's DM/PL plotting language and, according to the vendor, can be used with hundreds of graphics software packages.

Two models are available. The PC Plotter 595 enables users to produce 814- by 11-in. graphics, and the PC Plotter 695 allows for both 81/2- by 11-in. and 11- by 17-in. graphics. Both models work with any computer containing a standard RS-232C-compatible interface and feature a resolution of 0.004 in. and a plotting speed of up to 4.2 in./sec.

The PC Plotter 595 costs \$699, and the PC Plotter 695 costs \$799.

Houton Instrument, 8500 Cameron

Road, Austin, Texas 78753.

C. Itoh Digital Products, Inc. has introduced the Prowriter C-315 and Prowriter C-310 XP dot matrix print-

The C-315 is a 136-col. wide-carriage printer said to feature speeds up to 300 char./sec., bottom, top and rear paper feed and a push/pull tractor. Other features include a grap phic resolution of up to 240 by 216 dot/in., an 8-bit parallel or RS-232 serial interface and a variety of resident character fonts

The Prowriter C-310 XP lets users choose between Epson America, Inc. FX-85 and IBM Proprinter emulation. It also features print speed up to 300 char./sec. and a resolution of up to 240 by 216 dot/in.

The C-315 costs \$819 and the C-310 XP costs \$649.

C. Itoh, Suite 220, 19750 S. Vermont Ave., Torrance, Calif. 90502.

C. Itoh Digital Products, Inc. has announced the Chroma Pro CM 3000 red-green-blue monitor and the Chroma Pro CM 4000 enhanced graphics adapter-compatible monitor.

The CM 3000 is said to function as a monochrome monitor at the flick of a switch. For color graphics, it offers a resolution of 640 by 240 pixels.

The CM 4000 incorporates both high-resolution, enhanced 640 by 350 pixel and medium-resolution 64 by 240 pixel color graphics displays, conforming to IBM standards.

The Pro CM 3000 costs \$649, and the Pro CM 4000 costs \$799.

C. Itoh, Suite 220, 19750 S. Vermont Ave., Torrance, Calif. 90502.

Star Micronics, Inc. has introduced the NL-10, a nine-wire dot ma-

trix desktop printer.

The NL-10 is said to print draft quality at 120 char./sec. and nearletter quality at 30 char./sec. It features plug-in interface cartridges available for the IBM Personal Computer and compatibles, the Commodore Business Machines, Inc. 64/128 and standard parallel computers.

The NL-10 is priced at \$319. Each

interface cartridge costs \$60. Star Micronics, Suite 3510, 200 Park Ave., New York, N.Y. 10166.

Diconix, Inc. has introduced the Diconix 150, a portable batterypowered ink-jet printer.

The Diconix 150 prints on single sheets of letterhead or continuous-feed computer paper with near-letter quality at speeds up to 150 char./sec. in draft mode. It connects to computers with a Centronics Data Computer Corp. 8-bit parallel interface and has full emulation of the IBM Proprinter or the Epson America, Inc. FX print-

The Diconix 150 costs \$479. Diconix, 3100 Research Blvd., Dayton, Ohio, 45420.

#### **Board level devices**

Computer Peripherals, Inc. has announced the Overachiever en-hancement board for the IBM Personal Computer XT and AT.

The Overachiever includes 1.5M bytes of memory, expandable to 3M bytes with a piggyback board. The board includes two software packages: Flip-Up, which performs 13 office functions such as calculating and data transfer, and a utility software package, which offers disk manage-ment and printer spooling manage-

The Overachiever costs \$595 Computer Peripherals, 2635 Lavery Court, Newbury Park, Calif.

Everex Systems, Inc. has intro-duced a graphics board combining its Piggyback enhanced graphics adapter (EGA) board with its Enhanced Evergraphics board, a Hercu-les Computer Technology, Inc.-compatible monochrome adapter.
The combined board, which occu-

pies a single expansion slot, is said to support enhanced color graphics on an enhanced monitor while supporting monochrome text on a monochrome monitor at the same time.

The product is priced at \$350 for the Piggyback EGA, \$249 for the Enhanced Evergraphics board alone and \$599 for the combined boards purchased as a unit.

Everex Systems, 48431 Milmount Drive, Fremont, Calif. 94539.

Verbatim Corp. has announced Datalife Databank 30M-byte and 30M-byte plug-in cards and Datalife CPU-Card, a half-slot accelerator card, for the IBM Personal Computer

Datalife Databank occupies 11/2 ex-

Come discover the flexibility, functionality, speed and power of our Fourth Generation Language at our free INFORMIX\*4GL seminar.

We're offering two separate three-hour sessions in each of the cities listed below. One session for developers in end-user organizations and one for value-added resellers

To RSVP-and to find out specific times and places-please call Leslie Lane at (415) 322-4100, ext. #226.

Boston	June 2
Minneapolis	June 2
Chicago	June 4
New York	June 4
Philadelphia	June 6
Detroit	June 6
Dallas	June 9
Baltimore	June 9
Washington, D.C.	June 11
Houston	June 11
Los Angeles	June 13
Atlanta	June 13
San Francisco	June 16
Seattle	July 14
Toronto	July 14
St. Louis	July 16
Hartford, CT	July 16
Denver	July 18
Pittsburgh	July 18
Menlo Park, CA	July 21
Miami	July 21



#### RELATIONAL DATABASE SYSTEMS, INC.

INFORMIX is a registered trademark of RDS. © 1986, Relational Database Systems, Inc.

pansion slots. Access time is 78 msec, and the product supports hard disks of any capacity as well as the Xenix operating system from Microsoft Corp. It features a 3¾-in. hard disk with automatic locking heads.

with automatic locking heads.

Datalife CPU-Card is said to replace the Intel Corp. 8088 microprocessor chip with the 80286.

The 30M-byte Datalife Databank costs \$1,445, and the 20M-byte model costs \$1,195. The Datalife CPU-Card costs \$745.

Verbatim, 323 Soquel Way, Sunnyvale, Calif. 94086.

Genoa Systems Corp. has announced the Spectrum Plus graphics card as well as a reduced-size version of its Spectrum Prime graphics card.

Spectrum Plus, designed to take advantage of the 640K-byte random-access memory of the IBM Personal Computer XT, features extra functions such as clock and calendar, serial port and parallel port in addition to the Spectrum card's graphics functions.

Spectrum Prime fits any slot in the IBM Personal Computer and runs at speeds up to 9 MHz. It features compatibility with all monochrome and color monitors.

Spectrum Plus costs \$499. Spectrum Prime costs \$399 with parallel printer port and \$349 without.

Genoa Systems, 73 E. Trimble Road, San Jose, Calif. 95131.

Definicom Systems, Inc. has announced the DSI family of 32-bit coprocessor boards for IBM-compatible personal computers.

The boards are said to provide full 32-bit minicomputer architecture. Features include 32-bit very large-scale integration circuits said to run at a minimum of 10 MHz.

The basic board features up to 2M bytes of random-access memory (RAM). Larger boards are available with up to 12M bytes of RAM.

Prices start st \$1,495. Definicom Systems, Suite 108, 31324 Via Colinas, Westlake Village, Calif. 91362.

Intelligent Data Systems, Inc. has introduced the PC-88 Turbo High Speed Personal Computer and the PC-286 Advanced Technology Personal Computer processors.

sonal Computer processors.

The PC-88 is said to be IBM Personal Computer XT compatible. It operates at 4.77 MHz and 8 MHz. The product features a 16-bit Intel Corp. 8088-2 microprocessor and Microsoft Corp. MS-DOS 2.11 as well as 256K bytes of random-access memory (RAM).

The IBM Personal Computer ATcompatible PC-286 features the Intel 80286 processor and 512K bytes of RAM.

The PC-88 costs \$1,275, and the PC-286 costs \$3,360.

Intelligent Data Systems, 14932 Gwenchris Court, Paramount, Calif. 90723

Intelligent Data Systems, Inc. has announced the B-420 high-resolution text and graphics card for the IBM family of Personal Computers and compatibles.

The B-420 is a full-size Hercules Computer Technology, Inc.-compatible card featuring a resolution text mode with a capacity of 1,440 dots by 348 lines and an 18- by 14-char. box. In its high-resolution graphics mode, it contains 720 dots by 348 lines

The B-420 costs \$195.

Intelligent Data Systems, 14932 Gwenchris Court, Paramount, Calif. 90723

Intelligent Data Systems, Inc. has announced the EGA+ card, said to operate in 16 different text and graphics modes.

The card includes 256K bytes of random-access memory. It is a half-size card that supports the IBM family of Personal Computers and com-

patibles. It offers emulation of IBM's Enhanced Graphics Adapter with a resolution of 640 dots by 350 lines and Color Graphics Adapter with 320-dot by 200-line resolution.

EGA+ costs \$465.

Intelligent Data Systems, 14932 Gwenchris Court, Paramount, Calif. 90723.

Everex Systems, Inc. has introduced the Enhancer board, an enhanced graphics adapter video card said to be compatible with the IBM Enhanced Graphics Adapter.

The Enhancer includes a parallel printer port and 256k bytes of display memory and comes with the vendor's Egmode software. It also is said to provide 640- by 350-pixel resolution in 16 colors from a palette

of 64 colors.

The Enhancer board costs \$425. Everex Systems, 48431 Milmount Drive, Fremont, Calif. 94539.

Independent Business Systems, Inc. has announced a 12-slot and a 20-slot S-100 Motherboard.

Based on the IEEE-696 standard, the boards include a battery backedup clock and calendar. According to a 
company spokesman, the boards are 
actively terminated at both ends and 
were designed to reduce radio frequency interference on the bus.

The 12-slot Motherboard is priced at \$250, and the 20-slot board is priced at \$300.

Independent Business Systems, 5915 Graham Court, Livermore, Calif 94550



#### Introducing the Freedom ONE from Liberty Electronics

The Freedom ONE is the one terminal for all of your ASCII needs. With the Freedom ONE you don't pay more for advanced features. With the Freedom ONE you don't sacrifice features just because you pay less. At \$449 the Freedom ONE gives you the best of all worlds—in one terminal.

The Freedom ONE is designed to be there with all the features you need whatever your application. A 14-inch flat screen gives you the ultimate in crisp, clear characters in either 80 or 132 column display formats. Popular emulations like Freedom 200, WY-50, Viewpoint A2, TeleVideo 950, and ADM 31 let you fully utilize all

your existing applications programs. An adjustable height keyboard with 44 easy to program keys (88 with shift) lets you tailor the key layout and functions to your liking. Compact and attractive styling gives your workspace a state-of-the-art look with room to spare. These are just a few of the no-compromise, unbeatable features you get standard with the Freedom ONE.

For more information call Liberty Electronics today (415) 543-4353, and ask for it all. Ask for the ONE.



Preedom is a registered trademark of Liberty Electronics WY-80 is a trademark of Wyse Technology ADM is a trademark of Lear Singler, In: Viewpoint is a trademark of Applied Digital Data Systems, Inc. TeleVideo 580 is a trademark of TeleVideo Systems, Inc.



## WHATEVER YOUR NETWORKING NEEDS,

#### WE MAKE THE PIECES FIT.

Maybe it's simply linking all the personal computers in one department so they can share information.

Or perhaps it's giving a PC in sales access to the mainframe in accounting.

Or opening the lines of communications between equipment made by different manufacturers.

Or maybe it's accessing a mini on the West Coast with a terminal on the East.

Or maybe...we could go on and on, but you get the idea. In order to get the most out of the equipment you've invested so heavily in, the pieces have to work together. But there's no one simple networking solution because there's no one simple networking problem.

This is where AT&T comes in, with a

complete line of networking and communications products that can address your problems, whatever they may be.

#### FITTING IN WITH OTHERS.

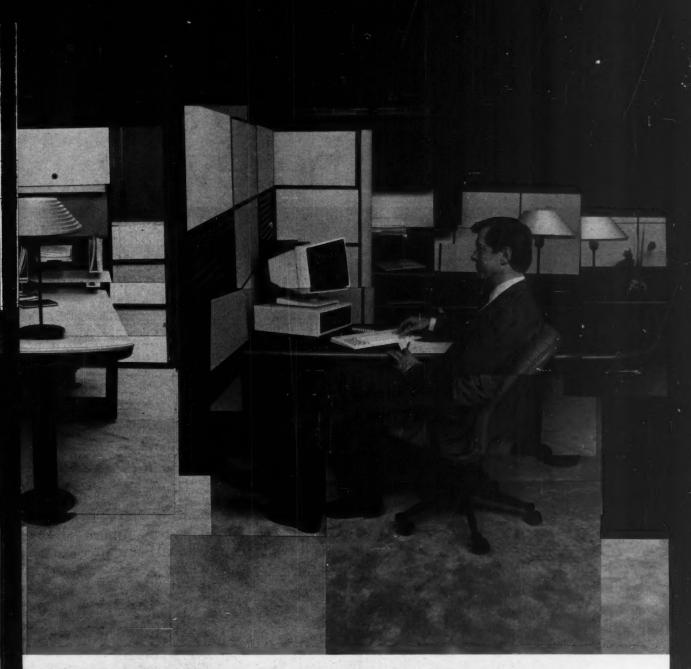
AT&T has the range of products to fit your business' specific networking needs, now and in the future. And you won't have to start from scratch because AT&T is committed to putting your equipment on speaking terms no matter where it is, what it does, or whose logo is stamped on it.

Take the first case—linking PCs. AT&T's STARLAN NETWORK can get your PCs sharing information and peripherals. After all, unless workloads require otherwise, it's less expensive for several computers to share one printer, rather than each having its own. If it's minis you want linked, AT&T's 3BNET gets our UNIX™ System family of computers and other data devices sharing both information and applications.

#### ISN: THE BACKBONE.

Now let's say you want a network that extends beyond a single department. AT&T's Information Systems Network (ISN) is the answer. It not only opens up communications between our own equipment and networks, but also those of other manufacturers.

With ISN, you can connect to indus-try standards, like the IBM SNA or 3270 environments. You can also bridge to Ethernet" systems. So a PC or work-station in one department can access an



#### AT&T HAS A NETWORKING SOLUTION.

IBM mainframe in another. Essentially that's like putting a mainframe on every

How is AT&T able to bring so many disparate elements together? One reason is our Premise Distribution System, our unique universal wiring scheme, composed of twisted pair and fiber optics. It's easy to install and manage, and is a long-term cost-effective alternative to bulky coax-based systems.

#### CROSSTOWN OR CROSS-COUNTRY.

You can also link AT&T System 85 or AT&T System 75 PBX and DATA-PHONE'II 724 and 735 multiplexers to your ISN for total voice and data network integration. For a campus environment, fiber optics, T-1 facilities and AT&T's Private Microwave equipment can also feed into ISN for low-cost, high-speed data transmission.

Now for the next logical step—linking your New York office with your Los Angeles office to form a corporate-wide network. This is accomplished by linking their respective ISNs, giving users in one location easy access to resources in both locations.

#### GET TOGETHER WITH ATAT.

AT&T products have a modular design, so you can build your network one step at a time, adding and changing as your needs dictate.

To get the most out of your system, get together with AT&T. Because an

office divided cannot stand.

Call your AT&T Information Systems Account Executive. Or call 1 800 247-1212, Ext. 223, for the number of the sales office nearest you.

'IBM is a registered trademark of International Business Machines

Corp.

"Ethernet is a registered trademark of Xerox Corp.



# The TeleVideo 955. Seeing is believing.

WYSE WY-50 (Unretouched photo)

TELEVIDEO 955 (Unretouched photo)

Sure, most \$600 terminals can scrunch 132 columns onto a 14" screen. But you need a magnifying glass to read them.

Not so with the TeleVideo' 955. That's because we redesigned the proportion of our characters and put more space between them. And then put them on a high contrast, super dark screen. The result is the most readable 132 column ASCII display available.

But there's more to the 955 than meets the eye.

Take our tilt-and-swivel positioning, for example. The screen rotates through

TELEVIDEO 955 VS. WYSE WY-50 AND WY-50+ FEATURES TVI 955 WY-50 WY-50+ Green or Amber Green Amber Only Screen Color Optional Graphics model No Dynamically allocated non-volatile function key memory 512 128 140 Maximum non-volatile bytes per function key 256 64 4 High contrast super dark Mat-sushita screen No

a full 270° right and left, and from -5° to +15° up and down. (Which makes backs and necks feel a lot better.)

Then we put all this in a machine with an incredibly small footprint, measuring just 9" x 12." The result is a terminal that meets all the human factors standards recommended for

adoption by the American National Standards Institute.

The TeleVideo 955. It's a real eye-opener.



TeleVideo®
Settle for more.

TeleVideo Systems, Inc., 1170 Morse Avenue, Sunnyvale, CA 94088-3568, (408) 745-7760 AMSTERDAM: 31.2503.35444, PARIS: 33.1.4687.34.40, LONDON: 44.9905.6464

O1986 TeleVision Systems, Inc. WYSE is a readement of Wyer Technology

#### See your TeleVideo distributor.

TELEVIDEO REGIONAL SALES OFFICES Sunnyvale (408) 745-7760 Newport Beach (714) 476-0244 D.H. MINICOM Los Angeles (213) 483-2400 DAVID JAMISON CARLYLE CORP Culver City (213) 410-9250 DIGITAL SOURCE, INC. San Diego (619) 569-9333 DUCOMMUN DATA SYSTEMS Cypress (714) 220-6588 EMERITIES Fresno (800) 325-9892 KIERULFF ELECTRONICS, INC. San Jose (408) 220-6300 LEASAMETRIC Foster City (415) 574-4441 PREMIER SOURCE DISTRIBUTING Irvine (714) 261-2011 San Jose (408) 946-3800 U.S. INSTRUMENT RENTAL San Mateo (415) 572-6600 VIVITAR COMPUTER **PRODUCTS** Santa Monica (213) 829-3672 WESTERN MICRO SYSTEMS Mountain View (415) 964-2050 FLORIDA **GENTRY ASSOCIATES** Orlando (305) 859-7450 GEORGIA TELEVIDEO REGIONAL SALES OFFICE Norcross (404) 447-1231 INFOTEC, INC. Atlanta (404) 458-1400 ILLINOIS TELEVIDEO REGIONAL SALES OFFICE Schaumburg (312) 397-5400 DATA ONE Prospect Hts. (312) 520-1300 PRO COM SALES Elk Grove Village (312) 860-1123 TEK-AIDS INDUSTRIES Arlington Hts. (312) 870-7400 UNITED STATIONERS Forest Park (312) 699-5000 INDIANA NASH & ASSOCIATES Indianapolis (317) 925-1050 MARYLAND FEDERAL DATA CORPORATION Rockville (301) 294-9682 MASSACHUSETTS TELEVIDEO REGIONAL SALES OFFICE Woburn (617) 890-3282 ARROW ELECTRONICS Woburn (617) 938-8700 BUTLER ASSOCIATES, INC. Newton (617) 964-5270 STRATUS COMPUTER Marlboro (617) 460-2000 MICHIGAN MIDCOM COMMUNICATIONS Southfield (313) 353-5696 STAR-TRONIC Farmington Hills (313) 477-7586 MINNESOTA AVNET COMPUTER

TECHNOLOGIES

Eden Prairie (612) 944-1114 BENCHMARK COMPUTER SYSTEMS Minneapolis (612) 831-2300 PC EXPRESS Burnsville (612) 894-9153 **NEW JERSEY** DATA STORE Cherry Hill (609) 779-0200 NEW YORK TELEVIDEO REGIONAL SALES OFFICE Syosset (516) 496-4777 ARROW ELECTRONICS Melville (800) 323-4373 MANCHESTER **EQUIPMENT COMPANY** Hauppauge (516) 435-1199 TRANSACTION CONCEPTS, INC. Forest Hills (718) 544-8898 TRICOM GROUP W. Hempstead (516) 483-9700 NORTH CAROLINA PEN-TECH SALES Greensboro (919) 852-6000 OHIO **COMPUTER PLACE** Brooklyn Heights (216) 351-7444 E.Q.S. SYSTEMS Chesterland (216) 729-2222 REYNOLDS & REYNOLDS Dayton (513) 443-2264 W.C. KOEPF & ASSOCIATES Chargin Falls (216) 247-5129 OREGON OMEGA DATA, INC. Hillsboro (503) 640-3995 PENNSYLVANIA ARCH ASSOCIATES Fernwood (215) 284-0327 TEXAS TELEVIDEO REGIONAL SALES OFFICE Irving (214) 550-1060 CARTERFONE COMMUNICATIONS Dallas (214) 630-9700 INTERPRINT, INC Austin (800) 637-0600 INTERPRINT, INC Houston (713) 465-0580 INTERPRINT, INC Plano (800) 527-5113 MICRO SOURCE OF TEXAS Richardson (214) 690-5111 US DATA CORPORATION Richardson (214) 680-9700 WASHINGTON DATEC, INC Seattle (206) 575-1470 DYNAMIC SYSTEMS NORTHWEST Mukilteo (206) 745-5311 VIRGINIA MARVA DATA SERVICES Falls Church (703) 893-1544 CANADA ARROW ELECTRONICS CANADA LIMITED Montreal, Quebec (514) 735-5511. COMPUTER DISTRIBUTION, INC. N. Vancouver, BC (604) 984-0641 DATAMEX, LIMITED Montreal, Quebec (514) 355-4923

#### TeleVideo\* Settle for more.

#### **NEW PRODUCTS/MICROCOMPUTERS**

Independent Business Systems, Inc. has announced the Slavenet 186/512, a 16-bit slave based on the 10-MHz Intel Corp. 80186 CPU.

The Slavenet 186/512 was designed for use in the IEEE S-100 bus. It features two serial ports with either 256K bytes, 512K bytes or 1M byte of dynamic random-access memory (RAM).

According to the vendor, it is capable of true 16-bit data transfers at 2M bit/sec

Prices range from \$995 for an 8-MHz 80186 with 256K bytes of RAM to \$1,512 for a 10-MHz 80186 with a full megabyte of RAM.

Independent Business Systems, 5915 Graham Court, Livermore, Calif. 94550.

Gespac, Inc. has introduced the GESMPU-48, a Motorola, Inc. 68000-based microcomputer board.

The board is built on a singleheight eurocard and is compatible with the G-64 16-bit microcomputer bus. It uses a leadless 68000 microprocessor running at 8 MHz and can accommodate up to 64K bytes of CMOS random-access memory and 128K bytes of on-board erasable programmable read-only memory. The board also features three programmable timers and an RS-232 serial port. It can address up to 8M bytes of external memory. The GESMPU-4B is priced at \$395.

The GESMPU-4B is priced at \$395. Gespac, 100 W. Hoover Ave., Mesa, Ariz. 85202.

Orchid Technology has announced the Turbo PGA, an IBM PGC-compatible graphics board for the IBM Personal Computer AT and PT

The Turbo PGA offers a resolution of 640 by 480 pixels with 256 displayable colors out of a palette of more than a quarter-million colors. It features an on-board 8-MHz Intel Corp. 80186 processor and is said to be able to achieve a peak fill rate of 300 million pixel/sec.

The Turbo PGA costs \$1,495. Orchid Technology, 47790 Westinghouse Drive, Fremont, Calif. 94539.

Orchid Technology has introduced the Turbo EGA single-slot enhanced graphics adapter (EGA) for IBM Personal Computers.

According to the vendor, the Turbo EGA contains four video adapters, 256K bytes of graphics memory and an Intel Corp. 80286 processor. It is compatible with the IBM EGA, Color Graphics Adapter, MDA and the Hercules graphics card.

The Turbo EGA card costs \$945. Orchid Technology, 47790 Westinghouse Drive, Fremont, Calif. 94539.

Pro-Log Corp. has introduced STD DOS Model OD 1.2, a two-card configuration of its STD DOS system.

STD DOS is Microsoft Corp.'s MS-DOS 3.1 on industrial-quality STD DOS hardware.

The system consists of two circuit boards. The 7863 multifunction CPU card includes an Intel Corp. 8088 microprocessor, a BIOS programmable

read-only memory (ROM), a clock and a tick interrupt.

The second board, a 7710 memory card, provides MS-DOS 3.1 in a 128K-byte ROM disk, a 128K-byte ROM disk for user programs, a 16K-byte work space random-access memory (RAM) and 112K bytes of static system RAM.

The Model OD 1.2 costs \$1,195. Pro-Log, 1560 Garden Road, Monterey, Calif. 93940.

TAT Graphics Group, Inc. has announced the Galaxy GA1024, a color graphics display controller board for use with personal computer computer-aided design systems.

The board is said to offer a noninterlaced 1,024- by 768-pixel display. It requires a red-green-blue monitor with a 48-kHz horizontal scan frequency. The Second Page option reportedly allows instant switching between two pictures on a single monitor.

The GA1024 costs \$42,295. The Second Page option costs \$300.

TAT Graphics Group, Building E, 1270 Lawrence Station Road, Sunnyvale, Calif. 94089.

#### **Auxiliary equipment**

Advanced Input Devices has unveiled the IBM-compatible Ergokey EKT 82 keyboard.

The keyboard features 82 keys. It is said to be smaller in width than conventional keyboards and therefore suitable for travel. It features nonsilicone elastomer switch-mat switch technology.

The Ergokey EKT 82 costs

Advanced Input Devices, W. 250 AID Drive, Coeur d'Alene, Idaho 83814.

#### COMMUNICATIONS

#### Controllers

Raycom Systems, Inc. has introduced the Raycom 3200, an IBM coaxial-compatible fiber data link.

The Raycom 3200 is said to allow optical-fiber replacement of coaxial cable used to interconnect the IBM 3274/3276 controller to 3278 terminals. It may also be used between Model 3290 coax multiplexers or between a remote multiplexer and its interconnected terminals.

The Raycom 3200 operates at a data rate of 2.36M bit/sec. It costs \$695 a pair.

Raycom Systems, 6395 Gunpark Drive, Boulder, Colo. 80301.

#### Voice/data communications

Communications Analysis Corp. has announced the Satellite-2M, a private branch exchange data collection device.

The package consists of a 2M-byte call buffer, a 1,200 bit/sec. modem, cable and Microsoft Corp. MS-DOS-based software. The unit connects to any private branch exchange's station message detail recording output using RS-232 cable. Its output connects to any standard telephone line

with a modular RJ-11 plug.

The Satellite-2M holds from 15,000 to 32,000 call records. Records are transmitted to the call buffer and can be retrieved using an IBM

Continued on page 100

#### **NEW PRODUCTS/COMMUNICATIONS**

Continued from page 99

Personal Computer and a modem.

The package costs \$2,495. Communications Analysis, 100 Fountain St., Framingham, Mass.

Kurzweil Applied Intelligence, Inc. has introduced the KVS Porting Manual and the KVS Run-Time Library for programmers wishing to in-tegrate the Kurzweil Voicesystem (KVS) speech recognition device with host computers and operating systems

The manual is said to describe the design, testing and operation of the KVS host-resident software. The runtime library is a collection of software subroutines called from a voice application program.

The KVS Porting Manual costs \$2,500; a separate copy of the KVS runtime library costs \$1,000. The KVS costs \$6,500.

Kurzweil Applied Intelligence, 411 Waverly Oaks Road, Waltham, Mass. 02154.

Honeywell, Inc. has announced the Delta-Plex Series 500 voice/data private branch exchange system. said to accommodate up to 120 stations initially, expandable to 240 sta-

The Series 500 includes a family of instruments. The CS10 is a 10-button programmable telephone with status lights and monitor capabilities. The

CS20 is a 10-button programmable telephone with status lights, speakerphone and a 20-char. alphanumeric display. The CSD model is a 20-button digital set with speakerphone and menu-driven 80-char. display.

The Delta-Plex Series 500 is priced from \$550 to \$800 per station line Honeywell, Honeywell Plaza, Minneapolis, Minn. 55408.

#### Protocol converters

Industrial Networking, Inc. has introduced the MIU-40 MAP Interface Unit, a general-purpose Manufacturing Automation Protocol (MAP) interface.

The interface is said to enable most MAP host systems or factory automation devices to attach to the vendor's MAP/One local-area network system. The MIU-40 includes a controller board, a 10M bit/sec. token-bus modem board and the vendor's custom dual gate-array chip set.

Data is passed from the host to the MIU-40 at 56K bit/sec. using the High-Level Data Link Control serial communications protocol.

The unit is priced at \$5,100. Industrial Networking, 3900 Freedom Circle, Santa Clara, Calif. 95052.

Kentrox Industries, Inc. has introduced the Slick Switch, a T1 interface system said to provide digital termination for T1 subscriber and loop carrier systems at the fiber in-

The Slick Switch provides error

detection, format conversion capability and automatic protection switching compatible with AT&T's SLC-96. It is integrated with provisions for order wiring and fault locating and is said to be the first application set for the vendor's T-Term T1 facilities ter-

Prices for typical configurations range from \$2,000 to \$5,000.

Kentrox Industries, P.O. 10704, 14375 N.W. Science Drive, Portland, Ore. 97210. Park

#### Software

Network Software Associates, Inc. has announced Synctalk, a peerto-peer synchronous communications and file transfer program for IBM Personal Computers and compatibles.

Synctalk is said to allow two personal computers to communicate and exchange files at speeds up to 9.6K bit/sec. using IBM's Synchronous Data Link Control protocol. Synctalk features data compression techniques, support of leased and dialed lines, Help screens, password protection and optional automatic dialing and call-directory features.

Other features include interactive message exchange and file transfer capabilities

Synctalk costs \$195.

Network Software Associates, 22982 Mill Creek, Laguna Hills, Calif. 92653.

Honeywell, Inc. has announced Mapstart, a development tool for integrated automation using Manufacturing Automation Protocol (MAP) networks.

Mapstart is a hardware and software package said to let manufacturers simulate and test MAP-compatisystems with applications specific to their own operations. Users may also implement a MAP network in pilot applications on-line.

The hardware consists of a Honeywell WCC 1250 work center controller featuring up to 8M bytes of memory and programmable in either C or Cobol. It can handle 32 simultaneous I/Os for real-time, on-line control

Mapstart costs approximately 176,000.

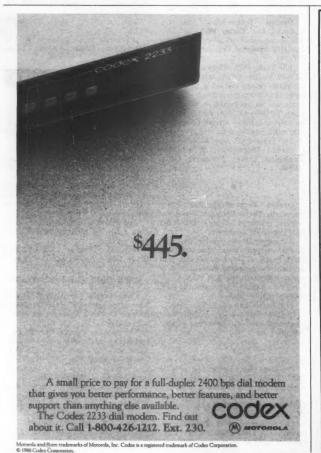
Honeywell, 2222 W. Peoria Ave., Phoenix, Ariz. 85029.

Pictel Corp. has annoucned MCT-200, a software package for its C-2000 Video Codec.

The software is said to boost the system's operating range to 168K bit/ sec. The package employs propri-etary compression technology, the vendor said. By operating at up to 168K bit/sec., MCT-200 is said to enable companies to create hybrid videoconferencing networks that con-tain both high-speed private tain both transmission circuits and switched 56K bit/sec. networks.

The MCT-200 will be available in the fall as a plug-in cartridge for \$9,500.

Pictel, One Intercontinental Way, Peabody, Mass. 01960.





COMPUTER PUBLICATIONS FOR THE PEOPLE'S REPUBLIC OF CHINA.

China Computerworld represents the first joint venture in the People's Republic of China between a foreign publishing company, CW Communications/Inc., and the government. China Computerworld is published twice a month and reports on computer hardware and software technologies. The total paid circulation is 70,000. Total readership is estimated at 2,000,000 copies with total distribution of 100,000 copies per issue.

And, now there's China Computer-world Monthly, a sister publication to China Computerworld, that provides 30,000 readers with even more in-depth analysis of the market.

CW International Marketing Sercw international Marketing Services makes advertising your products in the People's Republic of China, and around the world, easy. We have over 55 publications in more than 25 countries. For more information on our wide range of services, complete the coupon below and mail today.



Frank Cut

Managing Director International Marketing Services ham MA 01701-9171

☐ China Computerworld
☐ China Computerworld Monthly
☐ Your other foreign publications Ticle Addr City

Zip

# "With Computerworld, we're assured of strong reach-both locally and nationally."



Mike Albert Vice President Austin Knight Advertising

nyone who thinks recruitment advertising means just placing an ad in Sunday's paper is way behind the times." explains Mike Albert, Vice President of Austin Knight Advertising, an international recruitment advertising agency.

He and his agency colleagues look for publications which have good reputations and editorial prominance in the marketplace. In the computer field, their choice is Computerworld.

"Computerworld reaches just about everyone our clients need to reach," explains Mike. "Not just the individual who was fired on Friday. But potential candidates. Future customers. Talented users. Resellers. Manufacturers. Vertical markets."

And Mike has found that Computerworld reaches more than just the person whose name appears on the issue. "Computerworld is often routed within a department, and that means extra reach for our clients. Smart people read what the boss is reading. Computerworld gets the data processing geniuses and their statis—and the advertisers get the tree coattail effect," Mike continues. "With its pass-along, Computerworld reaches the full gamut of the computer-professional audience."

Computerworld gets better response — in quantity and quality — than many local and national newspapers, according to Mike. "Computerworld creates an environment that lends credibility and reach. It carries color which beats the dull and boring Sunday classifieds. And that credibility and reach produce quantity and quality that you just won't get from many other newspapers or magazines. Without a doubt, Computerworld is the best in the business," he concluded.

Computerworld. We're helping employers and top professionals get together in the computer community. Every week. Just ask Mike.

For all the facts, call Al DeMille, National Sales Manager, at (617) 879-0700.

#### COMPUTERWORLD

375 Cochituate Road, Box 9171, Framingham, MA 01701-9171/(617) 879-0700



#### **NEW PRODUCTS/COMMUNICATIONS**

Orion Software, Inc. has announced Network Orion, a set of integrated communications software programs designed for banking institutions using the IBM System/ 34, 36 and 38 computers.

The software is said to allow users to send messages into the international Telex network and access the international electronic mail networks. Banks can also intetheir application programs such as funds transfer, operational bank-ing reports, letters of credit and end-of-day bank position reports with various networks and communications resources.

Network

Orion costs

vice for dial-in access to your

LineMaster is a communica-

mainframe 3270 Bisync line.

tions watchdog which keeps

a line in service until a user

dials in

The Solution.

LineMaster An intelligent de- • For any remote 3271/4/6

\$5,000 to \$15,000 per site.

Orion Software, 1050 Waltham St., Lexington, Mass. 02173.

Frontier Software Development, Inc. has introduced APAC, a software package for automated and unattended control of Hewlett-Packard Co. protocol analyzers.

The APAC package is said to act as a master to one or more protocol analyzers operating as slaves. It combines real-time data gathering with number crunching and allows several tests to be linked together without user intervention.

-up to 19.2K baud.

Compatible with any 3270

BiSync emulator including microcomputers.

Connects between

\$795.

2551 Route 130

(609) 395-7800

Cranbury, NJ 08512

modem and mainframe.

Installs in minutes.

Other features include the ability to share host resources and create statistical reports. It has autodial modem support, so analyzers can be located at remote sites.

APAC costs \$1,995.

Frontier Software Development, 14 Livery Road, Chelmsford, Mass. 01824.

Communications Solutions, Inc. has introduced Disoss/Talk, said to provide a user interface to IBM office automation products such as the Distributed Office Support System (Disoss).

Disoss/Talk was designed as an option to the vendor's Access/DIA package, a portable software emulation of IBM's Document Interchange Architecture. Disoss/Talk enables users to distribute documents to one or more recipients, retrieve documents that have been sent by other users and search libraries to retrieve selected files.

Disoss/Talk runs on a range of multitasking operating systems, including Unix and Microsoft Corp. MS-DOS. When bought with Access/ DIA, it costs \$10,000.

Communications Solutions, 992 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129.

#### Multiplexers/Modems

Eventide, Inc. has introduced the Cloverleaf multiplexer/spooler for Hewlett-Packard Co. ·HP-IB-based devices.

The Cloverleaf is said to buffer data from up to three computers, queue each job and parcel out the material sequentially to up to two peripherals.

According to the vendor, the Cloverleaf can buffer files to pen plotters.

The Cloverleaf is available in three configurations: with 256K bytes of memory, the price is \$1,695; with 1M byte of memory, the cost is \$2,495; and with 2M bytes of memory, Cloverleaf is available for \$3,295.

Eventide, One Alsan Way, Little Ferry, N.J. 07643.

DEI-Teleproducts Division has announced the Model 1010 and the Model 1011, asynchronous short-haul modems

Both models are said to derive power from the RS-232C interface and to transmit data up to six miles at up to 9.6K bit/sec. and up to five miles at 19.2K bit/sec.

The modems come equipped with a six-ft line cord terminating with an RJ-11 modular telephone plug, the vendor said.

The modems cost \$90 each.

DEI, 230 N. Market Place, Escondido, Calif. 92025. Anderson Jacobson, Inc. has announced the AJ 2412-AD3H, an IBM Personal Computer AT-compatible 2,400 bit/sec. modem.

The modem is said to offer a full-featured memory dialer, programmable software options, an extended AT command set, callback and answerback security and multilevel password securi-

The AJ 2412-AD3H is said to communicate over the switched telephone network. It handles synchronous or asynchronous data and eight-through 11-bit characters and interfaces with most communications software packages.

The modem is priced at \$599.

Anderson Jacobson, 521 Charcot Ave., San Jose, Calif.

Cylink Corp. has announced the CIDEC-LS a Data Encryption Standard-based low-speed digital encryptor.

The CIDEC-LS operates in the full-duplex mode for synchronous communications between 1,200 bit/sec. and 112K bit/sec. It supports the RS-232C, CCITT V.35 and RS-449 interfaces.

The encryptor is said to Continued on page 104

# TECH

- MVS

– VTAM

-VM

-CICS

-VSE

- IMS

Full time Professionals Available to Assist your staff in the Installation, Conversion, Tuning, and Maintenance of the above products...and more.

#### Dowling Associates, Inc.

CLEVELAND AKRON CONN. NEW YORK (216) (216) (203) (212) 656-1136 650-0715 255-6316 912-1212

#### The CICS Report

#### Subscribe to your own CICS Consultant!

This monthly, six-page report keeps your programming staff up-to-date with the latest developments concerning IBM's CICS software system. The CICS Report contains useful information about:

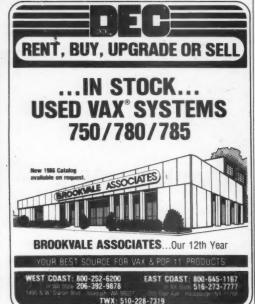
- CICS Programming and Design Techniques
- CICS Performance Issues
- CICS Product (software, publications, etc.) Reviews
- Readers' CICS Questions Answered
- · CICS "Tip of the Month"

#### Partial List of Subscribers

A.C. Nieleen of Canada Ltd.
Union Camp Copposition
Alipse Corporation
U.S. Senate Computer Center
Sinds Pitte Corporation
York University
Cybernetics & Systems, Inc.
Shawmut Bank of Boston
Salestact-bewen Wheel Pool
Indianapole Life Insurance
Contace Enterprises
Boston Gas Computer
Boston Gas Computery

leat Information Intermed County Datia Proc. follow Freight Systems, Inc. ippowsers Home Parties The Upjohn Company like Cross of Mass, Inc. Adlon Bank East Miller, Inc. whose Corporation The Pillabury Co. Deems Blinds, Inc. Seet Chis of Calumbas N.A. Heidday Irans, Inc.
McComfick & Dodge, Inc.
C&N Nelloral Bank
F. M. Wookneyth Co.
St. John Medical Corter
Materials Martin Corp.
Materials Martin Corp.
National University
Nelloral Processing
National University
Wells Fargo Bank, N.A.
Tolado Edison Co.
Lors Gate Hospital
Caractelian The Acosptance Lit.
Caractelian The Acosptance Lit.

To order The CICS Report, send your check or purchase order for \$95.00 (US) to The CICS Report / P.O. Box 1053 / Bethesda, MD 20817 ISO11 657-6658



# AIM HIGH!

Join over 1000 other top performing CICS sites.

Aim high ... the way Landmark Systems Corporation (LSC) did when they developed The Monitor for CICS. Experienced LSC. CICS system programmers created THE MONITOR to provide a complete CICS performance management solution in a single product.

In addition to both batch and online monitoring, THE MONITOR features unique management facilities—making it the superior alternative to CICS-PARS.

A recent LSC customer survey confirms our success: 98% of THE MONITOR users - are satisfied with the product: 96% are happy, with LSC customer support; and 100% Would consider ouving another Landmark Systems oduct.

So set your sights high. Contact Landmark Systems today. We're so sure we're on target we'll send you The Monitor for CICS to use for free for 30 days. Call 800-227-8911 in Virginia. (703) 922-7101).

The Complete CICS Performance Management System

Landmark Systems Corporation 5564 Fosdale Court

Landmark International Representatives

#### **NEW PRODUCTS/COMMUNICATIONS**

Continued from page 102

implement a proprietary, automatic electronic key management system called Seek. According to the vendor, even the system operator never has access to the Seek encryption method.

The CIDEC-LS is priced at \$2,500.

Cylink, 920 W. Fremont Ave., Sunnyvale, Calif. 94087.

Omnitel, Inc. has introduced the Encore 2400 HB, a 2,400 bit/sec. half-board integral modem.

The asynchronous modem, designed for use with the IBM Personal Computer, Personal Computer XT, AT and compatibles is said to be compatible with Hayes Microcomputer Products, Inc. products. It operates on the switched telephone network in full- or half-duplex operation at 300, 1,200 and 2,400 bit/sec.

Features include a speaker with software-controlled volume, call-progress reporting and automatic speed selection and fallback.

The Encore 2400 HB costs \$399.

Omnitel, 5415 Randall Place, Fremont, Calif. 94538.

Comdesign, Inc. has introduced the TC-1000 Unibus Concentrator and the TS-1000 Switching Multiplexer, two asynchronous multipoint multiplexers said to provide remote connectivity for personal computers and terminals to Digital Equipment Corn CPUIs.

ment Corp. CPUs.

The TC-1000 is a single hex-width board that supports 64 simultaneous sessions. It emulates the asynchronous portion of eight DEC DMF-32 communications controllers.

The TS-1000 is capable of connecting terminals from as many as four remote sites. Up to 32 computer ports and terminal connections are supported at each site at speeds up to 9.6K bit/sec.

Pricing starts at \$2,100 for the TS-1000. The TC-1000 costs \$7,500.

Comdesign, 751 S. Kellogg Ave., Goleta, Calif. 93117.

Western Telematic, Inc. has introduced the SM-21 Modem Security Unit, designed to prevent unauthorized computer system ac-

The unit allows users to set up security for incoming and outgoing calls. It connects to a computer's communications port and offers three levels of security using a 24-char. password and diaback field of password only, number only or both password and number.

The SM-21 costs \$495.

With a built-in modem, it costs \$695.

Western Telematic, 2435 S. Anne St., Santa Ana, Calif. 92704.

#### Local-area networks

SBE, Inc. has announced the SBE-MLAN-11, a plug-in Ethernet local-area network front-end processor for Intel Corp. Multibus systems.

The board is said to be able to handle gateway tasks linking local-area network and long-distance carriers.
The board conforms to Ethernet IEEE 802.3 specifications.

According to the vendor, the board provides an effective Ethernet transfer rate of 10M bit/sec. Full-duplex direct memory access operation is provided through the serial/parallel and ISBX channels. Protocols supported include X.25, Synchronous Data Link Control, High-Level Data Link Control, bisynchronous and

asynchronous.

In quantities of 100, the SBE-MLAN-11 costs \$1,495. SBE, 2400 Bisso Lane, Concord, Calif. 94520.

#### Network services

Timeplace, Inc. has announced that Edvent II, a data base containing descriptions of seminars and training programs, is available on the Compuserve, Inc. Information Service.

Users may select seminars

by subject, state or date. Information about each event includes title, content summary, sponsor, location, date, duration and cost.

The data base is updated twice a month.

Access to the Compuserve Information Service is via personal computer, communications software and a mo-

In addition to the regular Compuserve connect rates, Edvent II costs \$15 per hour, according to the vendor.



#### **NEW PRODUCTS/COMMUNICATIONS**

Timeplace, 460 Totten Pond Road, Waltham, Mass. 02154.

#### Test equipment

Mount Sina! Patient Care
Control Systems has announced the Response Time
Monitor, designed to pinpoint problem areas in a Burroughs Corp. communications network in graphic
form.

The unit is said to measure the impact of operational

procedures and program changes on system perfor-

The Response Time Monitor operates on an IBM Personal Computer, Personal Computer XT or AT. It monitors traffic on a Burroughs poll-select asynchronous communications line and records the delay between transmission and receipt of message.

The Response Time Monitor costs \$495.

tor costs \$495. Mount Sinai PCCS, Suite 406, 975 Arthur Godfrey Road, Miami Beach, Fla. 33140.

.

Atlantic Research Corp. has announced the NTS 3000 Network Restoration, Test and Management System.

The NTS 3000 is said to automatically monitor a network, restore service and access circuits with simple commands for troubleshootIt is composed of circuit alarms, A-B fallback and crossover switches, circuit access subsystems for testing, test equipment for troubleshooting, trouble tickets to document the problems and a data base management subsystem to summarize network activity.

A basic NTS 3000 configuration of 1,000 lines costs \$190 per line.

Atlantic Research, 5390 Cherokee Ave., Alexandria, Va. 22312. Atlantic Research Corp. has announced the NTS 2000 Distributed Network Restoration and Test System.

The NTS 2000 is said to restore service to remote data communications circuits from one location. Two configurations are offered, the LSC-2 system for CRT control of A-B fallback switches and the RCS-100 Remote Control Switch system for automatic reconfiguration, Touch-Tone or terminal control.

A basic NTS 2000 configuration of 1,000 lines is priced at \$155 per line.

Atlantic Research, 5390 Cherokee Ave., Alexandria, Va. 22312.

#### SYSTEMS & PERIPHERALS

**Turnkey systems** 

Syntrex, Inc. has introduced its Concorde family of 32-bit computers designed for the legal profession.

Continued on page 106

# rst Talkie Left Us Speechless. The year was 1927 and New York's chilly

The year was 1927 and New York's chilly October was about to get a blast of Hollywood heat. *The Jazz Singer* sizzled and left us wide-eyed watching the magic of Al Jolson.

We were introduced to the unbelievable. And it was the beginning of a wondrous, new era that made the silent movie look just plain dull.

#### We were talking about talkies.

Keeping in mind the movie industry's evolution, its technological leaps that have become an accepted fact of life, we'd like to introduce you to a service that will inevitably become a standard in maintaining complex voice and data communications systems.

Introducing Communications Service Assurance from PacTel Spectrum Services.

A service every MIS director and telecommunications manager wanted but refused to believe in.

"Wish list thinking," they said. And wish list thinking is what we're offering.

Communications Service Assurance represents a single source for problem detection, diagnosis and preventive monitoring, as well as expediting restoral of your corporate communications. It helps with expansion and alteration and gives you customized services.

Communications Service
Assurance provides a systematic
approach to improving your system performance. You're able
to concentrate on strategic MIS
responsibilities instead of playing
catch-up and reacting to the
hassle of day-to-day problems
plaguing your system.

Communications Service Assurance can be applied to any equipment, any protocols, at any site.

It incorporates diagnostic hardware and software.

It delivers teams of experienced test engineers from diversified backgrounds.

It accesses a unique system inventory data base.

It involves an ongoing industry relations program.

Remember, this is a service. We sell no hardware, lease no lines and repair no equipment.

What we do sell is increased reliability, productivity, bottom line cost-effectiveness and any level of expertise available 24 hours a day (we never close).

We're a wish that's a reality.
We're a service that will become
as important and accepted as
the first talkie.

And soon, you'll be talking about Communications Service Assurance.

For further information, please call 800-446-4321. Or you can write directly, PacTel Spectrum Services, 100 Pringle Avenue, Suite 750, Walnut Creek, CA 94596, attention N. Floyd, Marketing Director.

PAC \*\* TEL.
Spectrum Services

A Pacific Telesis Company



shopping center for IBM® systems and peripherals.

Dataserv has been in business for 15 years and we've participated in thousands of transactions totalling almost \$1 billion.

TRADE- year 34
BUY/LEASE- 3 new 36
for 68% GALL
FOR DETAILS.

We're a leading source for Series 1, S/34, S/36, S/38 and large systems and peripherals.

Before making your next computer equipment decision, ask for a DATASERY CUITOLUTE."

TOLL-FREE (800) 328-6729

dataserv

When you know what to buy.
Let us show you how and way.

#### **NEW PRODUCTS/SYSTEMS & PERIPHERALS**

ntinued from page 105 The Model 10 microcomputer has 2M bytes of memory and 67M bytes of hard disk storage. Models 30, 40 and 50 support up to 8M bytes of main memory, 16K bytes of bipolar cache memo ry and more than 1,800M bytes of data storage. The Model 60 has up to 16M bytes of main memory and 65K bytes of bipolar cache memoas well as more than 10,000M bytes of on-line data storage.

Prices start at \$15,000. Syntrex, P.O. Box 657, 246 Industrial Way W., Eatontown, N.J. 07724.

Phonetics, Inc. has introduced the Sensaphone Computer Monitoring System, designed to watch computer rooms, offices, laboratory facilities and any unattended property 24 hours a day.

The system warns users of environmental changes and alarm conditions.

If there is a problem, the Sensaphone Computer Monitoring System automatically calls up to four phone numbers and reports the alarm condition in English.

According to the vendor, the user can also call at anytime to check operating conditions.

Sensaphone Monitoring Systems are priced from \$250 to \$500.

Phonetics, 101 State Road, Media, Pa. 19063.

#### **Processors**

Ironics, Inc. has announced the Performer 32/D VMEbus Unix V.2 development/target system.

The multiuser system is sed on two of the vendor's VMEbus boards. Features include memory management and floating-point coprocessor facilities as well as parallel and serial I/O interfaces.

Mass storage includes floppy disks, 80M-byte Winchester disks, removable cartridge tapes and optional 9track tape.

A C-compiler and Motorola, Inc. 68000 assembler are provided with all Unix sys-

Prices start at \$17.335. Ironics, 798 Cascadilla St., Ithaca, N.Y. 14850.

#### **Graphics Systems**

Graphon Corp. has added the GO-235 to its GO-200 series of composite terminals.

According to the vendor, the GO-235 offers 1,024- by 780-pixel resolution and 60 Hz noninterlaced video.

It features graphics emu-lation of the Tektronix, Inc. 4010 through 4015 graphics devices and alphanumeric emulation of the Digital Equipment Corp. VT220 and VT100.

The GO-235 is said to write up to 52 lines of text to the 80 by 132-col. screen in alpha mode.

The GO-235 costs \$1,695. Graphon, 5th Floor, Tower One, 1901 S. Bascom Ave., Campbell, Calif. 95008.

TAT Graphics Group, Inc. has announced the Galaxy EGX2, a graphics display controller said to provide 800- by 600-pixel resolution.

The Galaxy board offers a multiplexing feature. It can display separately either IBM Enhanced Graphics Adapter board output at 640 by 350 pixels or Color Graphics Adapter output at 640 by 200 pixels monochrome and 320 by 200 pixels color.

The board comes with the Galaxy ADI driver for Autodesk Corp.'s Autocad. It is also available combined with the Digital Equipment Corp. Multisync monitor as the Sextant 814S display system.

The EGX2 graphics board costs \$1,195. The Sextant 814S costs \$1,995.

TAT Graphics Group, Building E, 1270 Lawrence Station Ros Calif. 94089. Road, Sunnyvale,

Seiko Instruments U.S.A., Inc. has announced the Screenplay digitizing tablet.

According to the vendor, the tablet is plug compatible with the Summagraphics Corp. Bit Pad Two. Screenplay is an 11-in. by 11-in. tablet featuring sampling rates up to 200 point/in. and resolution up to 1,000 line/

Screenplay supports three input device types: a four-button cursor, a mouse-like three-button cursor and a one-button stylus

Seiko Instruments that built-in diagnostic functions include power-on confidence test, on-line self-test and loop-back self test.

Screenplay is priced at

Looking for an information center system that handles just about anything they throw at you?



Trying to juggle end user demands without losing control?

Then you need RAMIS® II from Martin Marietta Data Systems. The first information center system that's as good to you as it is to your end users.

RAMIS II is a complete, integrated software package. Designed to make end user computing effective in your company at last. It enables your end users to develop everything from simple reports to complete personal applications without having to transfer data from one product to another. And it generates reports directly from VSAM, DB2 or almost any other file.

What's more, RAMIS II is the only product designed to support every level of user expertise. It offers a choice of a nonprocedural language, easy-to-use menus and Artificial-Intelligence software for both French and English.

And, with RAMIS II on the PC, you gain a stand-alone workstation or a seamless extension of your mainframe.

So if you thought you'd never find a way to balance your needs with those of your end users, you're in for a nice surprise.

It's ready now.

#### Call 1-800-257-5171 today!

Martin Marietta Data Systems RAMIS II Information PO. Box 2392, Princeton, NJ 08540

☐ I'd like a Representative to call.☐ Please send me literature.☐ Send me info on your other products.

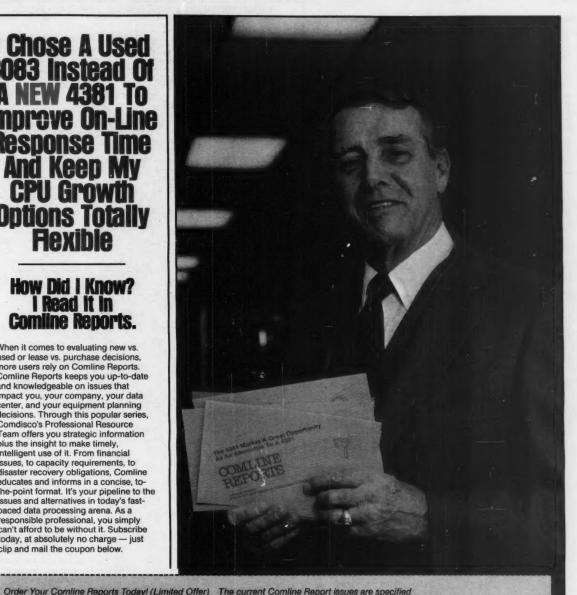
MARTIN MARIETTA

Martin Marietta's RAMIS II. We're ready now.

# I Chose A Used Options Totally Flexible

# How Did I Know? I Read It in Comline Reports.

When it comes to evaluating new vs. used or lease vs. purchase decisions, more users rely on Comline Reports. Comline Reports keeps you up-to-date and knowledgeable on issues that impact you, your company, your data center, and your equipment planning decisions. Through this popular series, Comdisco's Professional Resource Team offers you strategic information plus the insight to make timely, intelligent use of it. From financial issues, to capacity requirements, to disaster recovery obligations, Comline educates and informs in a concise, tothe-point format. It's your pipeline to the issues and alternatives in today's fastpaced data processing arena. As a responsible professional, you simply can't afford to be without it. Subscribe today, at absolutely no charge — just clip and mail the coupon below.



□ Capitalizing on the Used 3390 Market How best to utilize the older 3390 models.  □ Networking with 37X5 Front-End Processors The 3705 vs. 3725 — which one is best for your environment?  □ XA Migration: The Hardware Solution The "path of least resistance" but is it for you?  □ Core Recovery: The Prefuels To A Diseaser Recovery Program The sensible way to get a diseaser recovery program in motion.  □ Private Branch Exchange A hard look at the Big Three PBX Manufacturers.	Our PBX experience strategy for yy The 4341 Mar Atternative to Mip for mip, y be your best i Choosing a L What is remai succeed with PCs — Contin As with maint on short term Customer Via	rou'il discover why a us buy as an alternative to easing Company rketing? How critical is,	elop a sound quirements. by As An ed 4341 can a 4381. it? Can you reptosion leasing PCs is sense.	☐ The 3083 or the 4351-3  The value of a uniprocessor in an on-line environment.  ☐ Deta Center Relocations  From hardware duplications to physical planning to actual construction.  ☐ The 3080 Family vs. the Used 3080  Will the real 3090 please stand up?  (Future Issue)
Namo			Title	
Company			Phone	
Street	City	State	Zip	CPU's Installed/Model/Type
Mail to: Comdisco, Inc., 6400 Shaler Court, Rosemont	IL 00018 312/898-3	000		



#### MVS/XA, MVS, VSI users ASTUTE

The Data Set and Catalog Management System

- SIMPLIFY conversion to ICF catalogs
- RECOVER and COPY catalogs
- REPAIR catalog and VTOC prob
- Reports ONLY the data you need EASILY reclaim space from overallocated data sets
- **EASILY manage catalogs**
- ENFORCE standards for DASD
- CONTROL DASD usage and grow AID in DASD conversion
- CLEAN UP DASD
- and MUCH more.

45-day FREE TRIAL available! For more information, please call or write us now!

ASTCO | the software development specialists size Amarillo Avenue • Palo Alto CA 94301 + 415-856-0786

#### **NEW PRODUCTS/SYSTEMS & PERIPHERALS**

Continued from page 106 \$495.

Seiko Instruments U.S.A., 1623 Buckeye Drive, Milpitas, Calif. 95035.

AMF Logic Sciences, Inc. has introduced the Turbograph 2100, a high-speed processor for recording computer-generated images on color slide or print film.

According to the vendor, the vector-to-raster proces-

sor can accept graphics data from a variety of host computer systems, including PCs.

It is compatible with industry standard graphics command languages or Hewlett-Packard Co.'s Graphics Language.

An image is transferred to the Turbograph 2100 via an RS-232C serial data link. The digital controller converts the image to a 2,048- by 2,048-pixel raster format and passes it on to a digital film recorder.

The Turbograph

costs \$7,995. Logic Sciences, 10808 Fallstone Road, Houston, Texas 77099.

Technology, Westward Inc. has announced the Model 2315 graphics terminal and the Model 2216 color desktop graphics terminal. The 2315 features a 15-in.,

full square tube display with 1,024- by 784-pixel resolution, two independent graphics planes and Digital Equipment Corp. VT100 compatibility. It also in-cludes 512K bytes of displayment list memory

The 2216 provides 640- by 490-pixel resolution, 16 simultaneous colors and serial line speed to 38.4K bit/sec. It also has a 15-in., full square tube display, DEC VT100 and VT220 emulation and Tektronix, Inc. 4105 compatibil-

Both terminals are priced at \$4,995.

Westward Technology, 63 Great Road, Maynard, Mass. 01754.

Greyhawk Systems, Inc. has announced Softplot 2122, a 5-ft high graphics display device.

Softplot 2122 is said to display full-color D-size drawings. A black or white background can be selected.

It features a 16-level gray scale and lines that can be drawn at widths ranging from 10mm to 50mm in a single pass. There are 120 million addressable points.

According to the vendor, the Softplot 2122 connects to existing computer-aided design and manufacturing networks and emulates software plotting standards such as Hewlett-Packard Co.'s Graphic Language, Calcomp Co.'s 906/907 and Versatec, Inc.

Softplot 2122 is priced at

Greyhawk Systems 1557 Centre Pointe Drive, Milpitas, Calif. 95035.

Versatec, Inc. has announced Acris II, the Model 950 aperture card raster input scanner, as a replace-ment for its Acris I.

Acris II is said to offer users fine line detection capability as well as output resolution settings to accommodate the vendor's electrostatic plotters. It includes selectable variable windowing that provides users with the capability to define their own custom-image window size and magnification level.

Acris II is priced at \$16,750.

2710 Walsh Versatec, Ave., Santa Clara, Calif.

There's only one file transfer software package that can prioritize files. broadcast files, store and forward files, regardless of file type. with complete transparency under BSC and SDLC protocols, and can send those files faster than other systems. Only one. We call it SYNCRA Software.

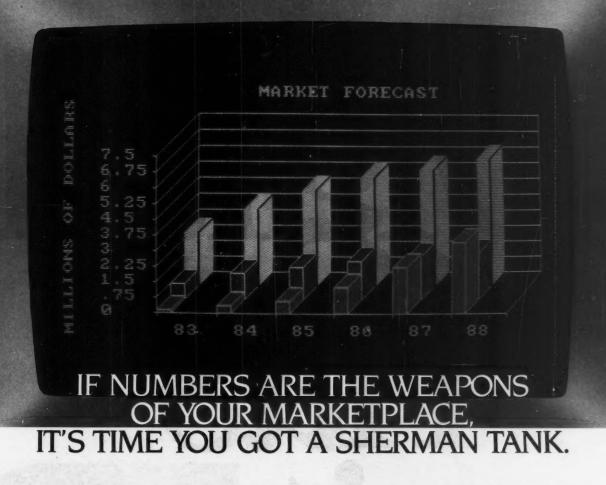
Its worth a call. 1-800-448-3400, Ext. 180



File-transfer software for compatibles and the incompatibles.

tails on available SYNCRA Software packages, or an appointment with an EASTCOM<sup>®</sup> sales ve. Or write us on your letterhead: EASTCOM, Dept. 180, P.O. Box 10394, Rochester, NY, 14610. SYNCHA and EASTCOM see trude

O Eastern Technology Inc., 1988, Eastern Comm.

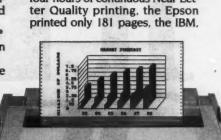


Sometimes, "crunching the numbers" simply means making them look good and getting them to the right people on time. And when people are under the gun, they need a printer that can translate their computer's impressive spreadsheet and graphics software to paper. Fast.

That's why a new MICROLINE® 290 series printer is the best weapon in the battle of the numbers.

OKIDATA MICROLINE 290's are faster than other leading printers in their class. And we can prove it. We recently compared the MICROLINE 292 to the IBM® Proprinter and the Epson® FX286.

The other printers require two passes of the printhead to produce crisp, clear Near Letter Quality text. But the MICROLINE 292 and wide-carriage 293 feature our unique "Dual Nine" printhead, that needs only one pass. The result? After four hours of continuous Near Letter Quality printing, the Epson printed only 181 pages the IBM.



215. But the MICROLINE 292 was the clear winner with 545 pages!

The 292 and 293 are winners in other ways, too, with speeds of 200 cps in the Utility mode. Color capability for impressive reports and presentations. Versatile paper handling. And a feature selection menu that's as easy to order from as pointing a finger.

OKIDATA printers are made especially for most PC's. Whether it's an IBM, AT&T\*, or

it's an IBM, AT&T\*, or Compaq\*, OKIDATA is fully compatible.

A slingshot was a terrific weapon once. But it's no match for today's big guns. When the battle lines are drawn, draw on an OKIDATA. Call 1-800-OKIDATA today.

OKIDATA® an OKI AMERICA Company

We put business on paper.

0

OKIDATA is a registered trademark of Old America. Inc.
Marque dépoace de Old America. Inc.
Marque dépoace de Old America. Inc.
UNICROUNE à a registered U.S. trademark of Old America. Inc.
IBM is a registered trademark of International Business Machines Corp.
AT6T is a registered trademark of American Telephone & Telegraph. It
Epoon is a registered trademark of Epoon Corporation

Epoon is a registered trademark of Epoon Corporation.

# Mas

Digital's LNO3™ desktop laser printers. They make your work on a Digital computer look its best, no matter what kind of work you're doing.

The LNO3's two resident typefaces give you letter quality printing in 16 different sizes, styles, and pitches, plus technical and national character sets. You can print on practically any cut sheet 81/2" x 11" paper, including letterhead, reproduction paper, and overheads. Additionally, the LN03's extensive software support lets you tailor the output precisely to your application. Optional cartridges provide a wide variety of typefaces and fonts. You can reproduce logos,



# Laser printers with the print quality your work deserves and the versatility your applications demand.

bar codes, forms, even your own signature. And the LN03 works with a full complement of Digital software, from VMS™ and ULTRIX™ to WPS+™, DECgraph™ and DECslide." All this with laser speed—and laser quietness. And if you need full page, high resolution graphics from sixel or Tektronix™ 4010/4014 files, the LN03 PLUS™ is available as an LN03 upgrade or as a fully integrated printer.

To find out more about the LN03, write: Digital Equipment Corporation, 129 Parker Street, PK03-1/9D, Maynard, Massachusetts

01754. Or call your local Digital sales office or

Authorized Terminals Distributor.

subment Corporation 1966. Digital, the Digital logo, LN03, LN03 PLUS, VMS, ULTRIX, WPS+, DECgraph and DECslide are trademarks of Digital Equ

#### **NEW PRODUCTS/SYSTEMS & PERIPHERALS**

#### **Data storage**

Cambex Corp. has introduced the Cambex Certainty 250 series, a disk storage system for IBM Series/1 us-

The series is available in 200M-byte increments that can be expanded up to 800M bytes per system. The system comes with an on-board cache memory of 512K bytes.
According to the vendor,

users can mount up to two disks in the standard IBM 4967 mounting space. The disk storage system is said to be IBM 4967 software compatible.

The Certainty 250 series is priced at \$20,000.

Cambex, 360 Second Ave., Waltham, Mass. 02154.

Storage Concepts, has announced the MV21 parallel transfer disk storage system for use with Digital Equipment Corp.'s Microvax

According to the vendor, the MV21 offers a sustained transfer rate of more than 8M bit/sec. It also provides a high-speed port for up to 9.3M bit/sec. data transfers.

The MV21 is comprosed of a rack-mountable disk processor, a single quad-height board assembly, a parallel transfer disk and a device driver for the MicroVMS operating system. It has five parallel channels.

A complete system is priced at \$42,400. The Microvax device driver is priced at

Storage Concepts, 3198-G Airport Loop Drive, Costa Mesa, Calif. 92626.

NCR Corp. has announced the ADP-53, a small comput-er systems interface (SCSI) to 1/2-in. Pertec Peripherals Corp. tape controllers.

The unit was designed to control up to four streaming tape drives using the industry-standard Pertec tape interface. It supports multiple tape speeds and densities as well as data formats.

Features include an SCSI copy function, a 64K-byte intelligent buffer memory with parity, sequential tape I/O and standard SCSI initiator and target roles.

The single-ended board is

priced at \$1,100. NCR Corp., 3718 N. Rock Road, Wichita, Kan. 67226.

#### **Printers/Plotters**

Versatec, Inc. has nounced the Model 250 RGB Video Controller, said to produce hard copy in color or monchrome from digital video sources.

The controller is said to allow video images to be output as hard copy on Versatec printers and plotters. It can capture color images from

any screen resolution up to 1,280 by 1,024 pixels. It has a selectable pixel expansion feature and an image-rotate option.

The RGB Video Controller is priced at \$2,500.

2710 Walsh Versatec, Clara, Calif. Ave., Santa

Polaroid Corp. has introduced the Chromajet 4000 ink jet printer, manufactured by Advanced Color Technology, Inc.

The printer offers four colors that can be combined for a palette of 1,000 color shades with resolutions up to 300 dot/in. Text can be printed in seven colors using bold, italic, double-width or condensed type styles.

Letter print mode operates at 27 char./sec. and 360 by 144 dot/in., and draft mode at 100 char./sec. and 120 by 72 dot/in.

The Chromajet 4000 will

be available in the third quarter of this year for prices ranging from \$2,000 to \$3.000.

Polaroid, 575 Technology Sq., Cambridge, Mass. 02139.

General Business Technology, Inc. has introduced the GBT 6640XP ion printer for the IBM System/34, 36

The nonimpact printer has a print speed of 30 page/min

and a resolution of 300 by 300 dot/in. It uses standard letter 81/2- by 11-in. or legal

8½- by 14-in. paper.
Dual input feeders hold up to 500 sheets each. User features include program- and operator-selectable page orientation, font, lines per inch, characters per line, copies and I/O feeder.

The GBT 6640 ion printer costs \$14,995.

General Business Technology, 1891 McGraw Ave., Irvine, Calif. 92714.



# GRAM-MAST he easiest way to esent the most complicated

Organization charts, Gantt charts and other "diagram" type charts have always been difficult presen-tation graphics to produce. Doing them by hand is a tedious and imperfect task which rarely looks professional. Most software programs simply replace the tedium of



hand rendering with the tedium of computer rendering.

And then there's DIAGRAM-MASTER from Decision Resource

Master diagrams in minutes.
We created DIAGRAM-MASTER for business people who don't have time to be computer people. It's not only easy to use, but it gives you features that other drawing programs simply don't have.

chart applications.
DIAGRAM-MASTER is the only program that automatically "lays out" complicated organization and Gantt charts, Our five-minute "get menus quickly guide you through



the process — you simply answer prompts like who reports to whom or when you want what done, and DIAGRAM-MASTER does the rest

Free form Drawing Board.
Need to make your point in a sicial way? Our Drawing Board givyou the flexibility to create custo diagrams on the screen using a

#### **NEW PRODUCTS/SYSTEMS & PERIPHERALS**

Tektronix, Inc. has introduced the 4696 Color Inkjet Printer, a desktop personal printer.

The printer features addressability of 120 dot/in. It offers four inks and can produce output on paper and transparency media.

Two system configurations are available. The 4696S Color Graphics Output System combines the 4696 and the 4510 Color Graphics Rasterizer. It is host-based and performs as a shared plotting resource off ASCIIbased computers.

The IBM-compatible CX4696S Color Graphics Output System is priced at \$8,995.

The 4696 is priced at \$1,795, the 4696S costs \$6,995, and the CX4696S costs \$8,995.

Tektronix, P.O. Box 1700, Beaverton, Ore. 97075.

#### **Auxiliary equipment**

Dataproducts Supplies

Division has announced the Centronics 350 nylon cartridge ribbon and the Burroughs 9246/Hitachi wideribbon printer ribbons, said to be compatible with printers from Centronics Data Computer Corp., Burroughs Corp. and Hitachi Ltd.

The Centronics 350 ribbon is priced at \$107 per six-pack. The Burroughs 9246/ Hitachi ribbons cost \$34 each for the 0.005 width ribbon and \$36 each for the 0.004 width ribbon.

Dataproducts Supplies Division, Suite 310, 15250 Ventura Blvd., Sherman Oaks, Calif. 91403.

Allied Electronic Services, Inc. has introduced the Tempo RTM Coax, a response time monitor (RTM) for use with IBM's 3179 and 3180, ITT Courier and most IBM terminal look-alikes.

The RTM Coax is said to interface with most termi-

nals using coaxial cables or an IBM 3274 controller. It records each transaction and compiles the daily information into a statistical data base. It is portable and provides software identification.

The Tempo RTM Coax is priced at \$3,295. The pollable model, for use in remote sites, costs \$3,495.

Allied Electronic Services, P.O. Box 819, Stonybrook Road, Lebanon, N.H. 03766.

## PRICE REDUCTIONS

On-Line Software International, Inc. has reduced the prices of its Omnilink/34, Executrieve/34 and Data Entry/34 software products for the IBM System/34.

Omnilink/34 is a System/ 34-to-personal computer file transfer software link. It now costs \$1,000. The file reformatting utility costs \$200 per copy, \$185 per copy for up to 10 copies and \$160 per copy for more than 10 copies.

Executrieve/34 is a data management package for retrieval, ad-hoc query, report writing and graphics. It costs \$1.500.

Data Entry/34 is an application tool for use with Executrieve/34 and is said to give users the ability to design single-screen applications for data entry and storage. It costs \$500.

On-Line Software, Two Executive Drive, Fort Lee Executive Park, Fort Lee, N.J. 07024.

Verticom, Inc. has announced price cuts on its VG series of Tektronix, Inc. terminal emulation packages.

The packages allow the IBM Personal Computer family and compatibles to take the place of Tektronix 4107 and 4109 devices. The packages incorporate Grafpoint's Tgraf-07 software and Verticom's graphics controller.

The new prices are as follows: VG-07, \$3,495; VG-07A, \$5,995; VG-09, \$2,795; and VG-09A, \$2,695.

Verticom, 545 Weddell Center, Sunnyvale, Calif. 94089.

Independent Business Systems, Inc. has announced price reductions on its 16-bit multiuser Ultraframe computer systems.

Ultraframe systems support from two to 32 users. They are available in configurations of hard and floppy drives as well as tape backup systems.

Prices now start at \$6,995. A typical 16-user system with a 74M-byte hard disk now costs \$24,235.

Independent Business Systems, 5915 Graham Court, Livermore, Calif. 94550.



BIAGRAM-MASTER is nowerful. You can create custom diagrams on the free-form Drawing Beard.



Or create an organization or Ganti chart move it to the Drawing Board.







library of many shapes and images Or you can create and store your own images (logos, symbols, etc.) for use in any DIAGRAM-MASTER chart.

You can even customize your organization and Gantt charts by moving them to the Drawing Board, then adding symbols, a logo, or any other appropriate diagram. Communicate through reports,

Nip-charts, overheads, slides.
DIAGRAM-MASTER conforms to only presentation style or requirement. All you need is an IBM PC or compatible, a printer or plotter (we support over 100); or a film recorder

At \$345, every business can

That's all it takes to put the power of DIAGRAM-MASTER to work for you. Join the over 100,000 busy executives who manage and present information with DIAGRAM-MASTER and other MASTER Series software from Decision Resources — CHART-MASTER®, SIGN-MASTER®, and MAP-MASTER. For a demonstration, call for the name of the dealer nearest you. Or return the coupon for our free DIAGRAM-MASTER kit including sample diagrams and a MASTER Series demonstration diskette.

In a hurry? Call 203-222-1974

DIAGRAM-MASTER and MAP-MASTER are trademarks of Decision Resources, Inc. SIGN MASTER and CHART-MASTER are registered trademarks of Decision Resources Inc.



**Decision Resources**Winning Business Graphics

#### NEWS



CALENDAR

#### **WEEK OF JUNE 8**

JUNE 8-11, NEW OR-LEANS — Ethernet Decision-Makers Group Exchange Conference. Contact: EDGE International, Inc., Suite 260, 1539 N. China Lake Blvd., Ridgecrest, Calif. 93555.

JUNE 8-11, TORONTO — World Computing Services Industry Congress V. Contact: Co-Ordination Plus, Inc., Suite 2102, 65 Queen Street W., Toronto, Ont., Canada M5H 2M8.

JUNE 9-10, TEANECK, N.J. — Machover on Business Graphics. Contact: Carol Every, Industry Representative, Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

JUNE 9-11, MYRTLE BEACH, S.C. — The Association of Small Computer Users in Education 18th Annual Summer Conference. Contact: Jack Cundiff, Horry-Georgetown Technical College, Conway, S.C. 29526.

JUNE 9-11, NORCROSS, GA. — Time and Motion Study Fundamentals. Contact: Institute of Industrial Engineers Registrar, 25 Technology Park/Atlanta, Norcross, Ga. 30092. JUNE 9-12, BOSTON —

Network Management/ Technical Control Conference and Exposition. Contact: CW/Conference Management Group, 375 Cochituate Road, Framingham, Mass. 01701.

JÜNE 9-12, CHICAGO — Com Lease Spring, The Computer Leasing Conference and Expo. Contact: Show Management Offices, 3825-I S. George Mason Drive, Falls Church, Va. 22041.

JUNE 9-13, SAN DIEGO

— MUMPS Users' Group
15th Annual Meeting. Contact: MUMPS Users' Group,
Suite 510, 4321 Hartwick
Road, College Park, Md.
20740.

JUNE 11, NEW YORK — The Semiconductor Industry — Its Changing Structure 1986. Contact: Robert Burton, L. F. Rothschild, Unterberg Towbin, 55 Water St., New York, N.Y. 10041.

JUNE 11-13, MAINZ, WEST GERMANY — International Tandem Users' Group 1986 Spring Conference. Contact: ITUG Headquarters, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

JUNE 11-13, TEANECK, N.J. — Machover on CAD/CAM. Contact: Carol Every, Industry Representative, Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

JUNE 13, DETROIT — James Martin Seminar — The End-User Revolution.
Contact: Thomas J. Bisacquino, Director of Education, Association for Systems Management, 24587
Bagley Road, Cleveland, Ohio 44138.

#### **WEEK OF JUNE 15**

JUNE 15-20, LONG BEACH, CALIF. — 1986 Government Management Information Sciences Conference. Contact: Tom Lang. Assistant Chairman, Data Processing Department, 9150 E. Imperial Highway, Downey, Calif. 90242.

JUNE 16-18, UNIVER-SAL CITY, CALIF. — Synergy '86, Conference on Functional Interfacing for Computer-Integrated Manufacturing. Contact: Cheri Willetts, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

JUNE 16-19, LAS VEGAS

The 1986 National Com-

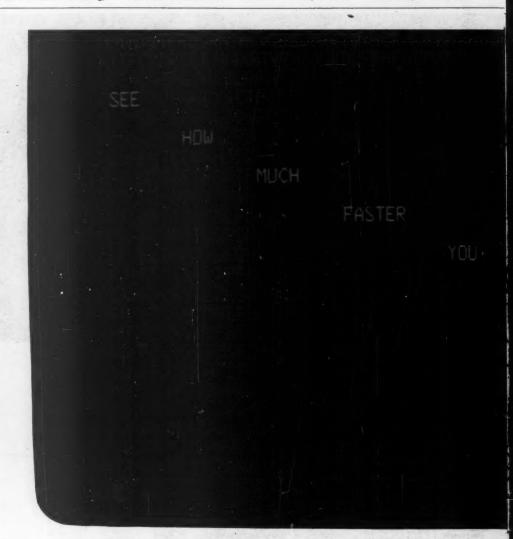
puter Conference. Contact: National Computer Conference, 1899 Preston White Drive, Reston, Va. 22091.

JUNE 16-20, CAM-BRIDGE, MASS. — Managing Information Technology: New Responsibilities in a Changing Environment. Contact: Center for Information Systems Research, Sloan School of Management, MIT, E40-193, 77 Massachusetts Ave., Cambridge, Mass. 02139.

JUNE 17-18, PLYM-

OUTH, MICH. — Robotic End Effectors: Design and Applications Seminar. Contact: Mary Dombrowski, Special Programs Division, Robotics International of the Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

JUNE 17-19, ATLANTIC CITY — Plas-Tech '86. Contact: Delia Associates, P.O. Box 338, Delia Marketing Communications Center, Whitehouse, N.J. 08888.



An IBM Color Display.

It can really boost an operator's efficiency. That's what REJIS found out. REJIS is the Regional Justice Information Service in St. Louis.

This information service is a trendsetting, government criminal justice network linking 120 different agencies to a central computer. REJIS quietly initiated a pilot program using IBM 3179 Color Displays. The units were tested under everyday conditions. Default colors were used, so no software changes had to be made. The quiet test turned into a smashing success.

End users were amazed to see how data popped and how mistakes

#### NEWS

JUNE 18-20, TOKYO -Marketing Opportunities Seminar. Contact: Agnes M. Pavel, Program Director, U.S. Telecommunications Suppliers Association, Suite 1618, 333 N. Michigan Ave., Chicago, Ill. 60601.

#### **WEEK OF JUNE 22**

JUNE 22-27, PHILADEL-PHIA — Management Information Systems for Strategic Advantage. Contact: The Registrar, Office of Executive Education, 200 Vance Hall, The Wharton School of the University of Pennsylvania, Philadelphia, Pa. 19104.

JUNE 23-25, ALBU-QUERQUE, N.M. — Integrated Fiber-Optic Technology Training. Contact: Linda Castle, Optoelectronic Sys-tem Consultants, P.O. Box 35525, Albuquerque, N.M.

JUNE 23-25, MIAMI -Electronic Data Processing Auditors Association 14th Annual International Conference. Contact: EDPAA,

P.O. Box 88180, Carol Stream, Ill. 60188. JUNE 23-26, BOSTON — ATE East '86. Contact: Registrar, Morgan-Grampian Expositions Group, 1050 Commonwealth Ave., Boston, Mass. 02215.

JUNE 23-27, AMSTER-DAM - Fourth Annual European Fiber-Optic Communications and Local-Area Networks Exposition. Contact: Information Gatekeepers, 214 Harvard Ave., Bos-

ton, Mass. 02134. JUNE 23-27, CHICAGO A/E/C Systems '86: The Computer and Management Show for the Design and Construction Industry. Contact: Conference Director, A/ E/C Systems '86, P.O. Box 11318, Newington, Conn.

JUNE 24-26, CHICAGO Structured Techniques Association III/Structured Techniques in the Eighties: Practice and Prospects. Contact: Heller Financial Corp., 105 W. Adams St., Chicago, Ill. 60603.

JUNE 24-27, CHICAGO Autocad Expo '86. Contact: William Ryan, Autocad Expo '86, Autodesk, Inc., 2320 Marinship Way, Sausa-

lito, Calif. 94965.

JUNE 25, CHICAGO —
International Facility Management Association's Computer Applications for Fa-cility Management. Contact: IFMA, Suite 1410, 11 Green-Plaza, Houston, Texas 77046.

#### **WEEK OF JUNE 29**

JULY 2-3, LAS VEGAS -Full Meeting of the Design **Automation Standards Sub** committee. Contact: Ron Waxman, Design Automation Standards Subcommitee Co-Chairman, IBM FSD, 9500 Godwin Drive, Manassas, Va. 22110.

#### **WEEK OF JULY 6**

JULY 9-11, NEW YORK — The Fourth Annual PC Expo. Contact: PC Expo, P.O. Box 1026, Englewood Cliffs,

#### **WEEK OF JULY 13**

JULY 13-18, CHICAGO Guide 65. Contact: Guide International Corp., 111 E. Wacker Drive, Chicago, Ill. 60601

#### **WEEK OF JULY 20**

JULY 23-25, BOSTON — Microtrends '86, Education: Redirecting the Revolution. Contact: International Communications Industries Association, 3150 Spring St., Fairfax, Va. 22031.

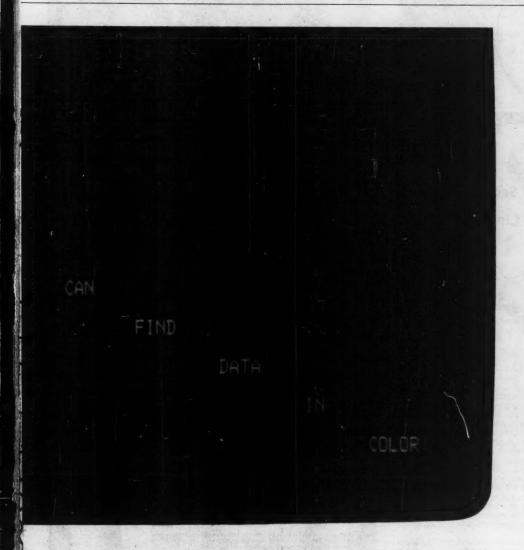
#### **WEEK OF JULY 27**

JULY 27-31, ANAHEIM, CALIF. - Third Annual Information Center Conference & Exposition. Contact: Information Center Conference & Exposition, Weingar-ten Publications, Inc., 38 Chauncy St., Boston, Mass. 02111

JULY 28-30, RENO, NEV. 1986 Summer Computer Simulation Conference. Contact: The Society for Computer Simulation, Box 17900, San Diego, Calif.

#### **WEEK OF AUG. 3**

AUGUST 4-8, ANN AR-BOR, MICH. - Contemporary Data Communication Networks: Planning, Management and Computer-Based Design. Contact: Engineering Summer Conferences, 300 Chrysler Center/ N. Campus, Ann Arbor, Mich. 48100



were easier to catch.

Soon, REJIS end users everywhere wanted IBM 3179 Color Displays. The result - IBM color displays are now being placed throughout the REJIS network.

Whether you have a small departmental system or a large computer, there's a range of IBM color displays

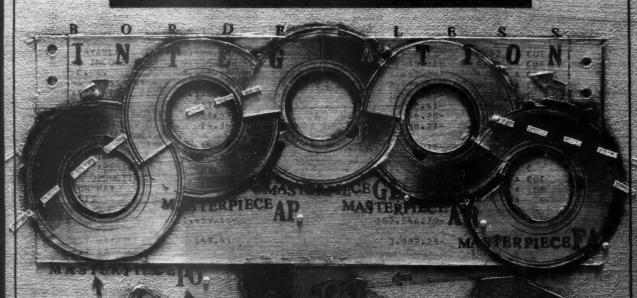
and color graphic displays that could help enhance your network's efficiency.

For your free demonstration diskette, "Why Color," call 1800 IBM-2468, Ext. BT/90. Or contact your IBM marketing

representative.



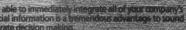
ONLY A MASTERPIECE OF FINANCIAL SOFTWARE CAN INTEGRATE THESE APPLICATIONS ON YOUR IBM MAINFRAME, DEC VAX OR IBM SYSTEM 38.



Ouery Society Micro Line

Navigation

Help



Being able to immediately integrate all of your company's financial information is a tremendous advantage to sound corporate decision making.

To selectively consolidate corporate wide reports to combine data from accounts payable and accounts receivable with purchase orders, general ledger and floed assets anytime, any day.

The Masterpiece' Sories does this for you. It's the only complete portfolio of financial software with full integration features for your BM maintrame, DEC VAX and IBM System/38—native to each environment. As such, it gives major compositions uniform financial reporting, even from multiple machine environments. You'll find Masterpiece to be faster, more powerful and more intelligently designed than any other financial software.

activare.

Paster, because information access is ensisted by borderies. Integrated applications, All applications share the same familiar English-like commands and screen prompts, so they're easy to learn and quick to us. More powerful, because Masterpiece includes a unique query and reporting system that gives even the occasional user a comprehensive tool to instantly.

DEGRACOUS

And more intermediate in wirtually any report format. Yes, Masser-Souriny, provides an advanced strengent agains unauthorized access.

And more intelligent because its efficient, modular design lowers De/MIS maintenance and raises user productivity willie expanding your future options.

Call or write for a copy of our 40-page brochure on how to integrate all or your financial information write gaining the security of doing business with General electric 5 oftware international—providing support or thousands of ISM maintraine, DEC VAX and ISM system/18 trans from 30 offices work-Avide.

486 - 242-4523 fin Manachuserts 1-500-522-0491 One feet forms, Andersey, MA 0458-2437



SOFTWARE INTERNATIONAL

massespiece

Section begins on page 150

# DCA seeks more acquisitions to maintain market status

# Anticipates rise of LAN, gateway technologies

By James A. Martin

ALPHARETTA, Ga. — The direction of the market dominated by Digital Communications Associates, Inc. (DCA) is expected to shift dramatically in the next few years. To stay on top, DCA is depending on both internal development and more acquisitions within the data communications market.

Although terminal emulation boards, such as DCA's trademark Irma, are expected to almost double in sales this year compared with last year, analysts are predicting that that method of linking micro to host will eventually be replaced by the more sophisticated local-area network (LAN) and gateway products.

For DCA, then, the key to maintaining its status as market leader is to continue its market focus but also to "expand horizons" within that focus, according to President and Chief Executive Officer Bertil D. Nordin.

Nordin confirmed in a recent interview that DCA seeks to acquire at least one additional data communications company this summer, probably in California or Georgia. DCA now has a strong presence in Silicon Valley after its merger earlier this year with the San Jose, Calif.-based micro-to-mainframe vendor Forte Communications, Inc.

Without specifying potential acquisitions, Nordin says the next logical step for DCA would be in the realm of LAN, gateway and T1 multi-

plexer products. Those areas, Nordin says, "will be very significant, and we will be in those businesses in a significant way. But it's hard to tell how fast users will embrace LAN technology, for example, when it's still a whole lot easier to use boards and coax cable."

"DCA is not completely wedded to any particular technol-

ogy," says analyst Mark Dunkel, vice-president of research for Robinson-Humphrey Co. in Atlanta. "Instead, they are wedded to their marketplace. I don't see the end of Irma anytime soon. However, DCA is aware of the fact there are competing technologies and is searching to acquire those products and companies that will give it those technologies."

DCA must plan for the technology emerging from its main competitor in the terminal emulation market, IBM The LU6.2 communications protocol, for example, "is certainly going to have a profound impact on the market, as it gives the best of both worlds, allowing PC-to-PC and PC-to-host transactions," Nordin says.

Both LU6.2 and IBM's Token-Ring

architecture are expected to become standards, and DCA is planning to develop products with those standards in mind. "I can't comment on how successful IBM's Token-Ring will be, but IBM's market impact is very significant, and we have to assume the Token-Ring will become dominant as a result," Nordin says.

In addition, DCA hopes to gain a stronger position in the emerging T1 market, with future enhancements of its high-speed multiplexer known as Netlink to include an interface with the Integrated Ser-

vices Digital Network.

DCA was founded in 1972 and is credited with introducing the first commercially available statistical multiplexer. In 1983, the company acquired Technical Analysis Corp. (TAC) of Atlanta, the developer of the Irma technology, now DCA's flag-

ship product line.

DCA has weathered the computer industry downslide remarkably well. In the third quarter ended March 31, DCA's sales were \$36 million, up from \$23 million the previous year. Income was \$5.8 million, compared with \$2.7 million. Sales and profits have risen steadily over the past five years. In fiscal 1985, ended last June, DCA reported sales of \$83.7 million, compared with \$51 million for fiscal 1984. Net income was \$10.5 million, up from \$6.7 million.

Forte is to become fully integrated under DCA's personal computer communications group, with Forte's president, Jim Ottinger, as head of that group.

Forte products will continue to be sold under their name.

"The Forte acquisition gives DCA a number of things it didn't have in the past," says Dunkel. "It increases their market share dramatically to about 60%, as Forte was the third-largest producer of communications boards behind IBM and DCA. Forte brings technological capabilities in graphics as well as the ability to support the LU6.2 protocol and Systems Network Architecture."

"We want to be a full-line data communications supplier, and there are certain parts of our product line we need to fill out in order to do that." Nordin said.



Bertil Nordin

NTRODUCING THE FIRST



WEEKLY COMPUTER TABLOID IN SWITZERLAND.

In 1985, Switzerland's total DP expenditures were \$3.1 billion. The Swiss computer market is growing at an average rate of 15% per year. The fastest growing segments of the computer market are micros and software.

Computerworld Schweiz is the first weekly tabloid newspaper serving the computer community in Switzerland and covers the latest developments in hardware and software. Computerworld Schweiz is modeled after Computer.

eled after Computerworld, its sister publication in the U.S. The editorial provides useful information for data processing professionals, including information on new products and services, new techniques and problem-solving methods and commentary on trends and developments in the computer industry.

CW International Marketing Services makes advertising your products in Switzerland, and around the world, easy. We have over 55 publications in more than 25 countries. For more information on our wide range of services, complete the coupon below and mail today.



CW COMMUNICATIONS/INC.

Frank Cutitta
Managing Director
International Marketing Servic
CW Communications/Inc.
375 Cochituate Road
Framingham, MA 01701-9171

Please s	send me more information on:
	puterworld Schweiz
	r other foreign publications
☐ You	r brochure "The Computer Marketplace in Switzerland"
Name	
Tirle	

□ Your brochure "The Computer Marketplace in Switzerland"

Name

Title

Company

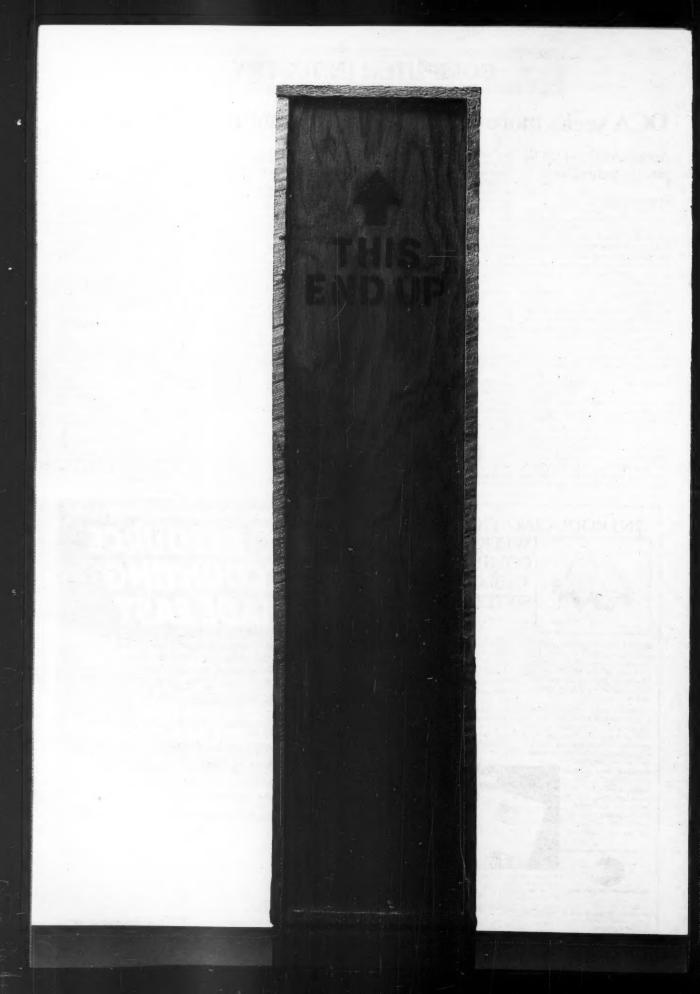
Addres

City

State

Zip





# PICK, PICK, PICK. SHIP, SHIP, SHIP.

At NCR, quality and quantity have a cause and effect relationship. We ship *lots* of Towers because OEMs know and trust NCR quality.

Our reliability fanatics know how to pick a nit. Our OEMs know how to pick a hit.

NCR's unique combination of research and development programs, quality assurance procedures, and massive production

capabilities allows us to deliver the highest quality products, in volume. On time. NCR spends over a

NCR spends over a quarter of a billion dollars every year on research and development. More than many computer companies gross.

Then, once a design is accepted for production, we unleash our nit-picking reliability fanatics. They subject every Tower product to a gauntlet of excruciating tests, culminating in a final burn-in: three full days of flawless performance.

The result of all this

concentrated effort is a Tower you can build upon with

certainty. A system nucleus with dependability engineered in every step of the way. And that means fewer service calls—higher customer satisfaction—from your accounts.

Equally important as delivering a product that lives up to your expectations is delivering that product *when* you expect it. And here's where all our nit-picking pays off, for you. Aided by our R&D and quality assurance efforts, our production lines fill orders for two or two thousand Towers, without missing a beat.

We've designed an unparalleled program at the NCR OEM Systems Division to say just one thing to ambitious OEMs: Go! Go! Go!

THE TOWERS.
BUILT FOR SYSTEMS BUILDERS
BY NIT-PICKING FANATICS.



## Justice approves GE's takeover plan for RCA

WASHINGTON, D.C. — After five months of deliberation, the U.S. Justice Department recently approved General Electric Co.'s plan to take over RCA Corp. for \$6.46 billion.

The antitrust clearance calls for slight modification of GE's plan, to which GE has agreed, signaling the beginning of the largest non-oil company merger in history. The merger could be completed by the end of this month, analysts say. The combined income of the potential merger could be higher than \$40 billion per year.

# IBM OKs stock buyback

By Clinton Wilder

ARMONK, N.Y. — IBM last week announced its first corporate stock purchase plan in eight years, authorizing a buyback of up to 10 million shares, or 2% of shares outstanding.

The company said the move reflects its belief that its shares are a good investment at current price levels.

Analysts said they felt that IBM is trying to boost its stock price. IBM's stock has lagged behind the current bull market, reflecting the company's sluggish first-quarter earnings and cautious outlook for the balance of the year.

IBM stock was trading last week in the \$145- to \$147-per-share range,

down from its 52-week high near \$162.

The program authorizes IBM to spend up to approximately \$1.47 billion in cash for stock repurchase purposes.

IBM has developed a strong cash position despite its slower earnings growth, and it held \$6.73 billion in cash and securities at the end of its first quarter March 31.

IBM also has an ongoing stock purchase plan to acquire shares for use in its employee and shareholder stock-option plans, according to company officials.

The company purchased approximately 12.8 million of its shares under that plan in 1984 and 1985.

# Bandwagons give a shaky ride

From page 150

bursting during its rapid rise in the '60s and '70s, suddenly had lots of empty seats. Many of those riders hopped onto the fast-moving DG and Wang bandwagons or chose to squeeze onto the ever-crowded Big Blue coach. Bandwagon riders unabashedly hitch their fortunes to a rising star.

While DEC descended, DG and Wang took flight. The consultants and computer press gushed about DG's beautifully conceived office strategy and lauded its landing of several multimillion-dollar accounts. They crowed loudly about Wang's willingness to open its architectures in order to preserve annual growth figures that rivaled Imelda Marcos' shoe budget.

But bandwagons have a funny way of collapsing under their own weight. In just a couple of years, the headlines have changed dramatical-

Computer Industry section begins on page 150.

ly. Suddenly, DEC is everyone's darling while the gates of Wang are burning. DG just quietly disappeared.

Other vendors know the phenomenon just as well. Where are all the Apple polishers of yore, and why are people now saying all those bad things about Lotus Development Corp., Cullinet Software, Inc. and AT&T? Even IBM feels the sting of desertion in a down market.

Make no mistake. The players generally deserve the bandwagon riders, because they themselves struck up the band. If the road to glory is built upon false hopes and empty catch phrases, then flat tires are inevitable.

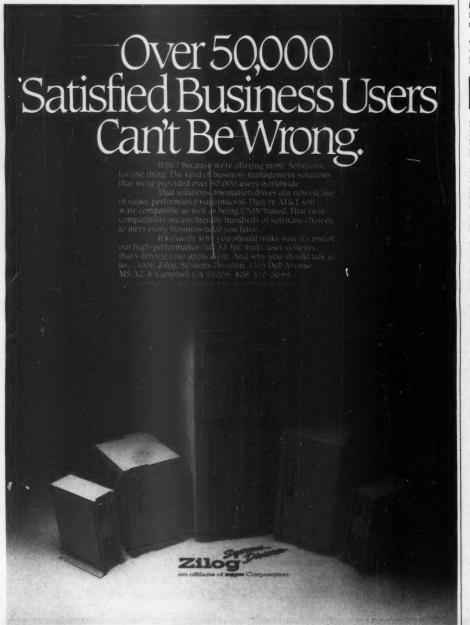
But more often, the true picture takes a lot longer to develop. Short-term problems, as in DEC's case, can give way to long-term promise. One company may react to an industry-wide slump better than another, but that may not spell doom or Chapter 11. High fliers may need to operate at lower altitudes, but that does not portend a crash.

The companies themselves are not the ones most affected by bandwagons, anyway. It is the users who face the toughest challenge in distinguishing between momentary lust and true long-term affection. How must MIS directors feel today

How must MIS directors feel today after purchasing \$1 million worth of equipment from yesterday's superstar? Should they feel abandoned by the consultants, analysts and writers they believed three years ago?

The enlightened user will have to look beyond the thundering bandwagon to find the answers. A bad fiscal quarter is no more reason to abandon a vendor's equipment than a good one is to buy from a vendor. It is incumbent upon MIS departments to check out long-term strategies, product lines and compatibility issues before pledging allegiance.

Though morale may currently be low in some vendors' boardrooms and the New England Patriots' locker room, good seasons may still lie ahead.



# **GO FOR IT**

# The Supermini Real-Time Benchmark Challenge

#### Take your best shot

We're throwing down the gauntlet and challenging you to challenge the best. If you're evaluating high performance supermini systems, demand a benchmark. Try the parallel processing power and awesome real-time efficiency of our 3280 MPS against the other guys. Read on and we'll tell you how to set it up today. But first, take a look at what they'll be up against.

The 3280 has:

- As low as \$26K per MIP
- Easy expansion
- Up to 33 MIPS
- Growth without replacement
- High availability
- Low life-cycle cost
- 64 MB/sec. bandwidth

And if that doesn't impress you, check out these High-End Supermini price performance numbers:

	Concurrent Computer Corporation 3280MPS	DEC 8600	DEC 8650	DEC 8800
Entry-Level System Price	\$250,000 to \$860,000	\$350,000	\$475,000	\$650,000
Performance in MIPS *	6 to 33.8	4.7	6.9	11.3
\$K/MIP	\$40.7K to \$25.5K	\$74K	\$68.8K	\$57.5K

List prices are for processor only or entry-level configurations.

\* Single precision whetstones.

## The truth is the proof

We're putting the test of real-time on the line.

All you have to do is fill out the coupon or call. We'll put you in touch with one of our worldwide benchmark centers. They'll show you how the 3280 MPS is making real-time performance history by meeting the toughest real world challenges.

We're ready for your challenge of the 3280 MPS. When we win... you win! The 3280 MPS from Concurrent Computer Corporation. To take the 3280 MPS challenge, or receive more information, mail the coupon. Or call toll-free: 1-800-631-2154.



I'll go for it. Name		
Title		
Company		
Address	_	
City	State_	Zip_
Phone ( )		
Application		
Mail to: Concurrent Two Crescent Place,		

# IBM OSI-based network predicted first on European mart

# Early bird efforts aim to unite Big Blue's systems

By Edward Warner Computerworld News Service

AMSTERDAM — IBM will be the first firm on the European market with an International Standards Organization's Open Systems Interconnect (OSI)-based network, a telecommunications industry analyst predicted at Eurocomm '36, a communications trade show held recently.

IBM will use OSI, which allows machines from different vendors to communicate, as the means to tie together all of its incompatible comput-

ers, according to Rudolf Strobl, a senior consultant with Software Research Corp., a Natick, Mass.-based firm that tests software for compatibility with industry standards. "The name of the game is openness — so IBM can sell more of its own computers," Strobl said at the conference.

Although he could not say when IBM would unveil a full implementation of OSI as an alternative to Systems Network Architecture, Strobl reported IBM has been showing selected customers an implementation of OSI, completed up to Levels 4 and 5 of the seven-layer OSI architecture.

. By becoming the first to fully implement the OSI architecture, Strobl

said IBM will beat European vendors to the OSI market and solidify its position in Europe where OSI compatibility is becoming a hot issue and where IBM derives about 25% of its revenue.

A group of 12 European vendors—including Siemens AG, N.V. Philps, Olivetti SPA, Nixdorf Computer AG and International Computers, Ltd.—has been working since 1983 to produce an implementation of all layers of OSI, but they are currently stymied by problems at the two uppermost layers, said R. W. Sutton, an assistant technical director for the UK's General Electric Co.

These problems will keep the group of European computer ven-

dors, known as the Standards Promotion and Applications Group, from achieving its goal before IBM, Strobl claimed.

In the U.S., a group of computer vendors came together late last year to form the Corporation for Open Systems (COS), a nonprofit group that would develop an OSI implementation and certify compliance with it. COS membership now boasts more than 40 vendors — including IBM — and the organization's war chest totals hundreds of thousands of dollars in membership fees.

Based on the interest in OSI shown by its competitors, IBM has rightfully decided OSI represents a major market opportunity and is pursuing OSI research on its own, Strobl said.

By beating its competitors to the market with full OSI implementation, IBM will be able to build special functions into the upper levels that only IBM users will be able to receive, although the specification will be available to its competitors.

# IBM selected as world distributor of Autodesk tools

SAUSALITO, Calif. — Autodesk, Inc. recently announced that IBM has acquired exclusive rights to distribute three Autodesk software products outside the U.S. for use with the IBM Japan Personal Computer, Models 5540, 5500 and 5560. IBM Japan will distribute the products in Japan, China, Southeast Asia and Australia.

The Autodesk products are Autocad drafting software in Japanese and other language versions; CAD-/camera, a scanning package that converts paper drawings to Autocad drawings; and Archicadd, a program that customizes Autocad for use in an architectural engineering environments.

IBM Japan demonstrated the Autodesk products at the Japan Business show in Tokyo recently.

# Firms sign ISDN R&D agreement

ATLANTA — The concept of a worldwide integrated communications network may have moved a step closer to reality recently with a research agreement between Northern Telecom, Inc. and Motorola, Inc.

The companies will collaborate on research and development of a new family of semiconductor components for use in the Integrated Services Digital Network (ISDN).

Northern Telecom will reportedly provide Motorola with network and system architectures, semiconductor device specifications and ISDN testing and evaluation results. Motorola will bring to the project design expertise in advanced semiconductor technology suitable for low-cost, high-volume manufacturing.

# Computerworld's New MICRO DIRECT SHOPPER An easy way for you to order micro products.

Now you can order microcomputer products directly from suppliers through Computerworld's new MICRO DIRECT SHOPPER.

Computerworld's display classified section now includes MICRO DIRECT SHOPPER, an all new section designed especially for companies that sell their micro products by mail or telephone orders.

This can mean a savings of money, time and energy in locating and acquiring the micro products that you need.

MICRO DIRECT SHOPPER will appear preceeding the Buy-Sell-Swap section every week in Computerworld.

See page 125

**COMPUTERWORLD** 



# Make this phone call or you'll never know what increased main storage can do for you.

If you want 512KB or 256KB memory cards for your IBM System/36, your choice is simple.

Wait for IBM to deliver its newest

Or call EMC and get immediate delivery.

Why you need more main storage in the first place.

Insufficient main storage is the single biggest limitation on the performance of your System/36.

That's because every user, application and peripheral requires

main memory.
By simply adding more main storage, you automatically speed up response time and improve productivity.

What makes EMC add-in memory

To start with, EMC's new 512KB and 256KB memory cards utilize 256K RAM technology. Our 256KB card, for example, has almost 50% fewer components and interconnections than IBM's. So it's inherently more reli-

able and consumes less power.
What's more, every single EMC memory board undergoes a rigorous 100-hour test and burn-in procedure in one of our own System/36's.

Our quality control pays off, too. Of the thousands of EMC memory boards installed in System/38's, not one has ever caused unscheduled system downtime.

We've installed more memory

in IBM minis than any
other independent supplier.
Our customers include leading Fortune
500 companies, such as Allied Bendix,
Equitable Life, Campbell Soup Company,
GTE and Bank of New York, to name but

And the list is growing longer every day. For

EMC is the only manufacturer of add-in menory to offer you an unconditional lifetime warranty.

And EMC memory boards are 100% compatible with your System/36. They fully support all IBM memory and memory diagnostic routinesand do not affect your IBM maintenance agree-

ment in any way.

Better yet, EMC's new 512KB and 256KB memory is priced a full 25% less than IBM's comparable memory. Our volume discounts and trade-up credits can make your savings even greater.

100% money-back guarantee.

If you're not 100% satisfied with your EMC memory for any reason, simply return the board within 30 days and we'll refund 100% of your money. No questions. No hassles. And of

course, no waiting.

To place your order for immediate delivery-or for more information-just call the toll-free number below today. Or mail the coupon to: EMC Corporation, 12 Mercer Road, Natick, MA 01760.

To order or for more information. call today:

1-800-222-EMC2 (In MA, call 617-655-6600)

YES, I'm interested in EMC memory for my System/36.

EMC Corporation; 12 Mercer Road, Natick, MA 01760.

No one is more committed to memory.

#### **Bell Atlantic** helps Sorbus

company that leases all types of products, including airplanes," Ross products, including airplanes,

Ross, who joined Sorbus last September after a 31-year career with IBM, hopes the broader exposure will enable the \$190 million firm to grab a larger chunk of the \$1.4 billion thirdparty maintenance market. The market is expected to grow about 12% this year, according to International Data Corp. (IDC) of Framingham, Mass

"Sorbus is growing as fast as the third-party maintenance market and has the second-largest market share in 1985, with about 12.9%," says IDC's Rebecca Segal. Bell Atlantic does not report Sorbus revenue separately, but IDC estimates that Sorbus grew 19% from \$160 million to \$190 million last year. While sluggish sales of computer-

related equipment in the past 18 months have wreaked havoc on suppliers, the slowdown has not ham-pered third-party maintenance companies like Sorbus, Ross claims. He notes that enhanced maintenance enables corporations to retain existing equipment, instead of purchasing more costly gear.

Yet since the third-party maintenance business is inextricably tied to the computer industry, a prolonged downturn could eventually affect Sorbus. "Our business depends on the availability of more and more prod-ucts to service," he says.

The third-party maintenance business continues to attract additional competitors, especially computer manufacturers looking for a way to offset shrinking hardware profit margins. Firms like Sperry Corp., NCR Corp. and Honeywell, Inc. are finding the higher profit margins of the third-party maintenance industry a significant attraction during the current industry slowdown, analysts say.

"It's easier to say who isn't in the third-party business as opposed to saying who is," suggests D. R. Mac-Naughton, president of Business De-velopment International, a Franklin Lakes, N.J., firm that tracks the maintenance industry.

But Ross contends that Sorbus has

not seen much competition from the computer manufacturers yet. "If you peel back the veneer and look very

carefully, it appears that these companies are not going to eat their own children by servicing a competitor's product," he explains. "Most would never give 360 degrees of total service anyway. They see it as a way of enhancing product sales.'

#### Spare parts availability

An issue more troubling to Ross is the lack of spare parts support provided by some computer vendors [CW, Oct. 21, 1985]. Only IBM, by virtue of a 1956 U.S. Department of Justine of the provided to the computer vendors. tice consent decree, is required to supply spare parts to the third-party industry, but other vendors are os-

tensibly free to do as they please.
"Theoretically, though, OEMs have to sell parts to customers," Ross says. "If these customers contract with a service company that can't service their equipment because they can't get parts, it doesn't reflect well on the manufacturer."

Sorbus, whose Greek name refers to a strong, multibranch tree that bears edible fruit, is branching out into a variety of new businesses. It has recently begun servicing disk drives on personal computers and is pushing into multivendor environ-ments. The firm has also recently joined archrival TRW by entering the so-called fourth-party maintenance business of refurbishing used equipment for computer lessors and other service companies.

To remain successful, Sorbus will be sticking to its knitting: servicing end users of IBM and compatible products as well as those of its former sibling company Basic Four.
"The key to this business is quality.
You can't just promise it; you have to deliver it," Ross concludes.

#### Bill said to aid U.S. high tech

From page 150

mandated retaliation can keep the pressure on other countries to open their markets to U.S. firms," said James J. Florio (D-N.J.).

In other provisions related to the computer industry, the bill would provide the following:

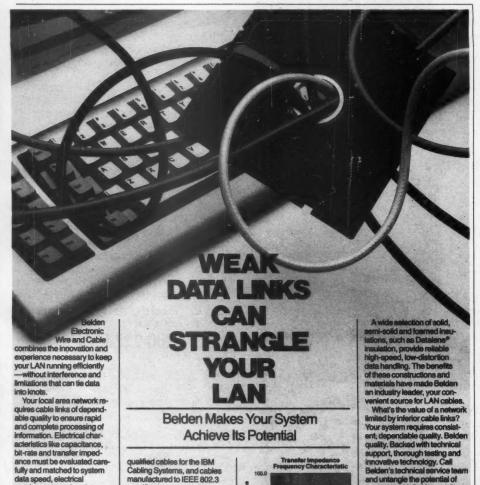
• Strengthen procedures under Section 301 of the Trade Reform Act of 1974 and require the president to retaliate against certain foreign trading practices within strict time lim-

· Add "export targeting" to the list of unfair trading practices that require retaliation. This would cover the kind of preferential treatment that Japan and Brazil give to their computer industries, according to legislators.

· Support the U.S. semiconductor industry's complaints against Japanese manufacturers as specified by an amendment that passed by a 408-5

· Require countries with excessive trade surpluses to reduce them by 10% per year or face U.S. penalties. Critics said this highly controversial provision, which would affect Japan, Taiwan and West Germany, will invite retaliation against U.S. exports.
• Require a 40% reduction in the

number of products on the export-control list, which regulates technology exports that could be used by the military of Soviet-bloc countries.



data speed, electrical

mental conditions. Belden

produces a wide range of

cables suited for use in LANs, including: multi-conductor. ired, coaxial, fiber optic,

and plenum products. Belden has also developed

a selection of cables spe fically designed for LAN applications. Ethernet\*,

ninet\*\*, AppleTalk†, IBM

Copyright © 1988 Copper Industries, Inc.

ments and environ-

specifications are available

minimize EMI and RFI inter-

ference and superior dielec-

trics for low signal loss.
Beldfoll®, Duololl®, Duobond ll®, and our Z-Fold are a few of the unique shielding designs

Belden<sup>e</sup> cable will keep your system operating smoothly with innovative shielding to

from Belden.

on on LAN requirement act Belden Electronic Cable, P.O. Box 1980,

1.0

sce of several

h charts the re

# MICRO DIRECT SHOPPER

#### GREAT SOFTWARE

AT MODEST PRICES

Communications
310 Cmodern—fast with windows
212, 334 Set up a BBS system Draw on your computer screen.

344, 345 PC Key Draw (graphics req.)

Spreadsheet 199 PC-Calc-simpler than Lotus

The PC-Fire III-Labels, come, letters

tweet percentage

78 PC-White, popular and powerful

388 100 Inmitters on dail

189 100 In

\$6 \$6 \$6 \$6 Recover lost files—File examine/repair util
(floppies only.)

133 Ultra Utilities, similar to Norton's

DOS Help and explanations for the new to 254 PC DOS Help 403 Computer Tutor, learn PC-DOS Househooping—Our favor

\$6.E

SPECIAL Any 5 Disks plus Directo plement and 1-Year Memi Only \$30 (Reg \$50)

Exp. date\_ Signature

To order, call: 808-245-6717 In CA: 808-222-2866 For technical questions or local orders: (406) 738-2291

miter impairing invited Compatibles

\$ 695

\$ 768

AT 8 mhs compatibles (a286) start at \$ 1465 w/1 Mag Ram, 360K Drv, TTL Ambr, M-Osfs

AT (a 286) w/1.2 Meg Drv 30 Meg Olmo HD, EGA card & 14" Mon. MS-Mouse, 2 Meg Ram. The works... \$ 4100

R Systems Warranty is 12 mo.

BOA card + 14° Mitsubshi Mos. \$ 820

ISHVAR Technology



**SEWhen** we brought out the PC's Limited AT with its 8 MHz option included, it was hailed as a technological breakthrough. And with 1024K RAM on the motherboard, serial and parallel ports built in, and the wide range of options we provide, it became a smash success at \$1,995.

Now we're breaking the \$1,500 barrier for IBM PC-AT™ compatibility, with our new price: \$1,495. And remember, every PC's Limited computer we sell comes with a 30-day Money Back Guarantee of your satisfaction. 33

-Michael Dell, President

At \$1,495, the PC's Limited AT includes an 80,296-based system unit running at 6 MHz and 8 MHz (keyboard-switchable);
\$10,24K RAM on the motherboard; 1.2 meg floppy-disk drive; combined floppy/hard-disk controller card; AT-style keyboard;
\$102-watt power supply; 2 earla ports and 1 parallel port; clock/calendar with battery backup; and 8 expansion alots.

The unit has the same bus configuration as the IBM PC-AT. It runs all major software written for the IBM PC, PC-XT and PC-AT and carries a one-year Limited Watzanty.

We offer a wide range of options to complete your system.



1611 Headway Circle, Building 3, Austin, Benan 78734
Sales Calls from anywhere in the country, (512) 339-6962
Technical Support Calls, (512) 339-6964
Telex No. 9103808366 PC LTD FAXIS12) 339-6964

- SCREENIO 2.0 -Realia COBOL screens are a snap with SCREENIO 2.0!

Buy Realia COBOL (\$995) and SCREENIO (\$400) from us and get \$100 off or a free Kedit. Or, ask us for a FREE demo disk.

NORCOM Post Office Box 897 uness, AK 99802-0897 (907) 780-6464 Telex: 5106014951 NORCOM Qualified companies can SCREENIO for free! Call us.

#### Wanted IBM PC XT AT

 Used or New Surplus No deal too large or too small - we do it all.

The Computer Traders, Inc. 2262 NW Pixwy., Suite L Marietta, GA 30067 404-980-9233

#### TOSHIBA-IBM COMPATIBILITY P341 P351 P321 P1340 P1351 P1350

BPECIAL OFFER. Buy 1 interface and get IDT'S FileMenager disk utility for only \$19.96. flor a limited lines colly.

o Compages - all in come programs of the compage of

(209) 561-3139

# Hardware and software for the business PC.

<ul> <li>denotes IBM-AT compatibility.</li> </ul>	Migent Software (not copy-protected)	Sapphire (3 outlets; EMI/RFI filtered) \$47.	DRIV
SOFTWARE	-Ability 1.0A	-Ruby (6 outlets; EMI/RFI filtered; 6 ft cord) 55. -Command Center SPECIAL 79.	IOMEGA (90 days)
	-MultiMate 3.31	DCA (1 year)	→Bernoulli Box 20 Meg w/F
We only carry the latest versions of products.	-MultiMate Advantage 3.6 269.	-Smart Alec	-10 Meg cartridge
Version numbers in our ads are current at press	Hantucket Software (copy-protected)	-lma 769.	Bernoulli Box 40 Meg w/l
time.	Clipper (Winter '85 version)	Epson (1 year) We are an authorized Epson service center.	-20 Meg cartridge
Aliaba Calturas (ast some protected)	Paperback Software (copy-protected) VP-Planner 1.0	LX-80 printer (80 column)	Mountain Computer (1 Drive Card 20 Meg
Alpha Software (not copy-protected) Keyworks 2.0	Peter Norton (not copy-protected)	FX-85 printer (80 column) call	PC Connection (1 year)
Ashton-Tate (copy-protected)	Norton Commander 1.0	FX-286 printer (136 column)	20 Meg Hard Drive Card
dBase III Plus 1.0	Norton Utilities 3.1	-LQ-800 printer (80 column) call	Seagate (1 year)
Framework II 1.0	Quarterdeck (not copy-protected)	LQ-800 printer (80 column) call LQ-1000 printer (136 column) call	20 Meg Internal Hard Dri
Best Programs (not copy-protected)	DESQView 1.2	Hayes (2 years)	cables)
PC/Tax Cut (1986 version for 1985 taxes) 119.	Satellite Software (not copy-protected)	-Smartmodern 300	Toshiba (90 days) PC, XT 360k Drive (51/4")
PC/Fixed Asset System 3.1	WordPerfect 4.1	Smertmodern 1200	AT 360k Drive (51/4" half-i
THE WORD 3.1 (KJV Bible) 159.	Enable 1.1	-Smartmodern 1200B (w/Smartcom II) 349. -Smartmodern 2400 579.	PAI SOUN DIIVO (S74 Hall-)
THE WORD 3.1 (NIV Bible) 159.	Software Publishing (copy-protected)	-Smartmodem 2400B (w/Smartcom II) 539.	MEMO
Bortand International (not copy-protected)	PFS:File B:01	-Smartcom II 2.1 (software) 69.	
Turbo Tutor 1.0	PFS:Write C:01	Hercules (2 years)	64k Memory Upgrade Se
Turbo Database Toolbox 1.2	"Harvard Total Project Manager 1.1 289.	-Hercules Color Card (parallel port) 159.	system board or any mer
Turbo Graphix Toolbox 1.0	Not copy-protected versions due to be released	Hercules Graphics Card (parallel port) 299.	150 nanosecond (set o
Turbo Editor Toolbox 1.0	soon—call.	Intel (chips: 1 year; boards: 5 years) Above Board PC 64k (upgrades to 2 Meg) call	200 nanosecond (set of 200 na
Turbo Gameworks 1.0	TRAINING	-Above Board AT 128k (upgrades to 2 Meg) call	System Board (9 chips p
Turbo Lightning		Above Board PS 64k C/S/P (upgrades to 1.5	-256k Memory Upgrade S
Sidekick 1.5	ATI (copy-protected)	Meg)call	IBM-AT memory board (S
Traveling Sidekick (reg. Sidekick) 45.	~SKILL BUILDER PROGRAMS	8087 (for IBM-PC & XT) 129.	
Traveling Sidekick w/Sidekick 73.	Intro and How to Use:	8087-2 (works on 8 Mhz computers) 177.	DIS
Reflex 1.1	Data Bases MS-DOS	-80287 (for 6 MHz IBM-PC AT)	All Palata and Plates
Superkey 1.1	Compaq PC-DOS IBM-PC BASIC each 33.	-80287-8 (for 8 MHz IBM-PC AT) 269.	All disks have a lifetime w DS/DD Disks for the PC
Superkey/Sidekick Package	TRAINING POWER PROGRAMS	Kensington Microware (1 year)  Masterpiece	10 disks per box.
Turbo Prolog 1.0 65.	How to Use:	key tronic (90 days)	~Verbatim Datalife
Turbo Holiday Pack	dBase II dBase III Lotus 1-2-3	5151 keyboard (deluxe) 169.	-Maxell MD-2
(Pascal 3.0, Tutor, and Database Toolbox) 67.	Multimate Framework Displaywrite 3	-5153 keyboard (with touch pad) 279.	DS/High Density Disks
Turbo Family Jumbo Pack	Multiplan Wordstar	Mouse Systems (3 years)	10 disks per box.
(Pascal 3.0, Database, Editor & Graphix	WordPerfect Symphony each 43.	PC Mouse with PC Paint +	-Fuji
Toolboxes, Tutor and Gameworks) 135.  Breakthrough (not copy-protected)	Individual Software (copy-protected)  The Instructor II	PC Mouse with Ready and PC Paint + 149. NEC (90 days)	-Maxell
Timeline 2.0	Professor DOS	Multisync monitor (EGA compatible) 549.	>verbaum
Broderbund (copy-protected)	-Tutorial Set (both items above) 49.	Orchid Technologies (1 to 2 years)	-Flip Sort (holds 75 disks)
Graphics Library 1	-Typing Instructor	Orchid Technologies (1 to 2 years) Conquest Multifunction Board Øk upgrades	-Floppiciene Disk Drive
Print Shop	-Training for Lotus 1-2-3 (for vers. 1A & 2) 37.	to 2Mb, fully supports LOTUS/INTEL expanded	
Computer Associates (not copy-protected)	Training for dBase III	memory specification (EMS) 264.	OUR P
SuperCalc 3 Release 2.1	HARDWARE	Tiny Turbo 286	We accept VISA and MAST
Dac Software (not copy-protected) -Dac Easy Accounting	HANDWANE	PC Turbo 286e w/1 Meg	(Only on U.S. & Canadian of
Evergreen (not copy-protected)	Manufacturer's minimum limited warranty	upgrades to 1 Meg, fully supports	<ul> <li>No surcharge added for ch</li> </ul>
One Write Plus 1.01	period is listed after each company name.	LOTUS/INTEL expanded memory specification	<ul> <li>Your card is not charged ur</li> </ul>
Executive Systems (not copy-protected)	Some products in their line may have longer	(EMS) and Error Correction Code (ECC), serial	<ul> <li>If we must ship a partial ord freight on the shipment(s) to</li> </ul>
-XTREE 2.0 (file & directory manager) 37.	warranty periods.	and parallel ports optional 399.	<ul> <li>No sales tax.</li> </ul>
5th Generation (copy-protected)		Paradise Systems (1 year)	<ul> <li>All shipments insured; no a</li> </ul>
Fastback 5.03	AST Research (1 to 2 years)	Color/Mono Card	<ul> <li>Allow 1 week for personal a clear</li> </ul>
Funk Software (not copy-protected) -Sideways 3.11	SixPakPlus 64k includes Sidekick vers. 1.5 not copy-protected & DESQView 169.	Modular Graphics Card	<ul> <li>UPS Next-Day-Air available</li> </ul>
Sideways 3.11	SixPakPlus 384k (fully populated) 219.	Princeton Graphics (1 year)  MAX-12E Amber monochrome monitor 179.	COD max. \$1000. Cash or
Cornerstone 5.1	AST-5251-11	-HX-12 RGB monitor (690 x 240) 449.	<ul> <li>120 day limited warranty or</li> </ul>
Lifetree (not copy-protected)	_AST-3780	Quadram (1 to 2 years)	<ul> <li>To order, call us anytime Me</li> <li>9:00, or Saturday 9:00 to 5</li> </ul>
-Volkswriter 3 1.0	Advantage 128k	Expanded Quadboard	business offices at 603/44
Living Videotext	RAMpage! upgrades to 2Mb call	Øk (upgrades to 384k) 169.	Friday 9:00 to 5:30.
ThinkTank 2.1 (copy-protected) 105.	RAMpage! AT upgrades to 2Mb call	384k (fully populated) 219.	OUTE
Ready 1.0 (not copy-protected)	Both RAMpage boards support EMS and fully	Silver Quadboard Øk (upgrades to 576k) 249.	SHIP
Micro Education (MECA) (copy-protected)  -Managing Your Money 2.0	support EEMS. Amdek (2 years)	MP 64 (64k) upgrades to 512k	Note: Accounts on net term
Micropro (not copy-protected)	Video 310A mono monitor (amber) 159.	QuadEGA+ (half-card)	Continental US: For monit
WordStar 3.31	Color 722 - RGB (EGA compatible) 519.	SMA (20-day money-back guarantee)	add 2% for UPS ground shi
WordStar 2000 Plus Release 2 285.	Curtis (lifetime)	PC-Documate Keyboard Templates	or UPS Next-Day-Air. For all order to cover UPS shipping
Microrim (not copy-protected)	ACCESSORIES	available for:	order to cover UPS shipping UPS 2nd-Day-Air at no extra
Extended Report Writer 1.3 85.	Low Profile Tilt and Swivel Pedestal 25.		than 2 days from us by UPS
Clout 2.0	PC Pedestal (for IBM Mono or Color) 27.	-DOS/Basic 3.0-3.1 WordStar	monitors, printers, and drive
R:base 5000 1.01			charge will be added. For a order. Alaska and outside
-R:base 5000 Multi-user 1.0 719.	Printer Stand		

#### VES

2111120
IOMEGA (90 days)
Bernoulli Box 20 Meg w/PC2 card \$1999.
-10 Meg cartridge
Bernoulli Box 40 Meg w/PC2 card 2499.
-20 Meg cartridge 69.
Mountain Computer (1 year)
Drive Card 20 Meg call
PC Connection (1 year)
20 Meg Hard Drive Card 489.
Seagate (1 year)
20 Meg Internal Hard Drive (w/controller and
cables)
Toshiba (90 days)
PC, XT 360k Drive (51/4" half-height) 109.
AT 360k Drive (51/4" half-height) 117.
MEMORY

64k Memory Upgrade Set for IBM-PC or XT system board or any memory board	
150 nanosecond (set of 9)	15.
200 nanosecond (set of 9)	12.
128k Memory Upgrade Set for IBM-AT	
System Board (9 chips piggybacked)	39.
256k Memory Upgrade Set for any	
IBM-AT memory board (9 chips)	39.

#### SKS

10 disks															•					•					
-Verbatim																									
Maxell M	D.	2																							19.
DOGEL-L	-	Lon	-		h	v	E	N	8	k	\$ f	OI	ri	th	e	1	4	ľ	(5	36	3	T	P	1)	
																			,					•	
10 disks	06	r	b	00	۲.								,												
10 disks į Fuji	06	r	bi	0)	۲.																				27.
DS/High 10 disks p Fuji Maxell Verbatim	96		bi	00	۲.																				27. 34.
10 disks i Fuji Maxell	06		bi	00	۲						 														27. 34. 34.

#### POLICY

- STERCARD.
- n orders.) charge orders.
- until we ship. order, we never charge o) that complete the order
- additional charge.
- al and company checks to
- or certified check.
- on all products.\* Monday thru Friday 9:00 to 5:30. You can call our 46-3383 Monday through

#### PPING

Mole: Accounts on net terms pay actual shipping.
Continental US: For monitors, printers, and drives, add 2% for UPS ground shipping. Call for UPS Blue or UPS Next-Day-Air For all other learns, add \$2 per order to cover UPS shipping. We will automatically us UPS 2nd-Day-Air at no extra charge if you are more than 2 days from us by UPS ground. Hawell: For monitors, printers, and drives, actual UPS Blue charge will be added. For all other items, add \$2 per order. Alasias and outside Continental US: Call 603/446-3363 for information.



WordStar 2000 Turbo Pascal

6 Mill Street Marlow, NH 03456 603/446-3383

For the IBM-PC (XT & AT) exclusively.

| Survice Survices Su

# Word-a-holics

Trying to decide which word processor to buy is like trying to decide which college to go to. The decision will change your life forever, but you may never know if it was the best one. Here are line tried and proven professional packages.

They all have spell checkers. None are copy-protected. And hard drives are recommended for all. See PC Magazine 1/28.

secret Word 3.0 with Outline
secret Word 3.0 with Outline
a mouse and a graphics card, MicroSoft Word lets you move
words around without touching the keyboard, and see what
you got without squirting. Without a mouse or a graphics
card it's still a powerful word-processor, with "Style
Sheets" that simplify formatting, and a builk-in outline

We have a friend who writes for computer magazines.

At one time or another he has used and reviewed virtually every major word processor. He now swears by MondPerfect and swears at all the others. Use his program for a while and you'll be able to touch type major than the other word of the program for a while and you'll be able to touch type major than the other word of your commands with your eyes closed and your right hand tied behind your back.

to Demino your Gazox.

\$280 WordStar has had some trouble shedding its image as the lumbering dinessur of the microcompute age. But hundreds of thousands of people use it. There are a tool of programs out there to back but had not been seen to be a second to be

helitawriter 3.0. \$147

Solid performance with a reasonable price continues to be Volkswriter's claim to fame. It's test, and boasts one of the original what-you see is-what-you pelf screens. With the new version's spell checker and more sophisticated print formating, it is now able to complete functionally with the other high-end word assors. (Our new low price is pretty persuasive too).

# Buyone. Get two



database! What? No database? Have we got a deal for you (and your friend). Until June 30, Microrim will send you a complete second copy of R:base 5000 free when you send in your warranty card and a copy of our sales invoice. So you can get together with your friend, split the cost for one and get two! Or. you can keep the extra copy at home, at a branch office, or down the hall. R:base 5000 is easy to learn and operate, and has the custom reporting features most users need. Remember, the two for one offer is only good from April 15 till June 30

(Additional R:base 5000 from 

# Chips

Fully tested, factory fresh 9-chip sets from the lead-ing chip manufacturers, such as TI, Samsung, NEC, Hitachi, Oki, etc. All chips and chip sets come

64K (200Ns)	\$12 ea. set
64K (150Ns)	\$15 ea. set
128k or 256k (150Ns)	\$39 ea. set

#### Bernoulli Berserk!

We've got a problem. The prices we're able to offer on Bernoulli bo We've got a protein. The prices we're alse to often on Bernoullin boxes are changing about 10 times taster than we can change this ad. Probably because the machines are selling about 10 times taster than anyone ever dreamed they would. The 20 Meg and 40 Meg versions feature two ½ height drives with removable cartridges. There's a 90 day warranty, and we're an authorized Bernoulli service center—turnaround on repairs is usually 45 hours. Here are our latest up-to-date-but-probably-obsolete-by-now prices!

Bernoulli	Box 40	Meg							3	2	1	4	99	
Additional 20	Meg Carts	idges .	 	 									\$6	9
Bernoulli Box	20 Meg .			 								\$	199	9
Additional 10														
Bernoulli Care	Kit				 		 						\$7	9

#### Supercalc ifragilistic!



SuperCalc 3 is the kind of product that you'd be proud to bring home to your mother. Like Lolus 1-2-3 it offers spreadmomer. Live Lotus; 12-3 it orders spread-street, information management and presenta-tion graphics. But it only needs 128k of RAM, and is not copy-protected. It also is compatible with the Hercules Monochrome Card, as well as the Enhanced Memory (EMS) and Enhanced Graphics (EGA) stan-dards. And you get a free copy of Sideways, the program that lets your printer think horizontal is vertical.

30% off our usual unusual low price-call!

#### SixPakPlus Minuss!



AST is so wrapped up in Enhanced Memory and other arcane subjects that they've been letting the price slip on their original claim to fame-the AST SixPakPlus, one of the original and best multifunction cards. So if you're just starting in computing, or outili-ling a second unit for home, now's a great time to buy this basic piece of hardw You get a clock calendar, serial port, parallel port, up to 384k of memory, and copies of two classic unprotect programs-Sidekick 1.5 and DESQView. A

..\$169 SixPakPlus 384k (fully populated) ......\$219

#### Herculean rebate!

The Hercules monochrome graphics card has saved hundreds of thousands of PC owners from terminal myopie, by supplying crisp clean monochrome graphics. The Hercules color card is the industry standard for color graphics. Both come with a parallel printer port, and a full two year warranty. And from May 1 through August 31, Hercules is offering a \$50 rebate on either

ercules Monochrome
Graphics Card ......\$299

(and get \$50 rebate from Hercules) Hercules Color Card (1/2 slot) . . . . \$159 nd get \$50 rebate from Hercule

(10 per box) tim DataLife (DS/DD)

(Floppiclene 514" Head Cleaner) . . . . \$18

<u> CHESTON</u>

Tip Sheet



Name: Jennifer Aiken Title: Sales Representative Claim to fame: Has eaten several pints of Ben & Jerry's White Russian ice cres at a single sitting.

"What do you mean your PC's too slow? Manual typewriters are slow. Doing spreadsheets by hand-that's slow. Admit it. When you first got your PC you thought it was the fastest thing you'd seen since high school. Ah, but the bloom is off the rose, as it were. And now you can't bear washing those precious milliseconds. When you start a search, or a merge and purge, or a spreadsheet revision you want the thing done faster than you can say "Gimme!"

you can say "currene" will, Vay Well, Viay, Well, Viay, Well, O'lay, W Turbo Boards. Don't wait."

MICRO DIRECT SHOPPER

COMPUTER SYSTEMS

1-800-433-5184 Order Computing Since 1980, D&B Rated

Why settle for 5 year-old design technology when you can have the sensational 8 MHz



TCS TURBO PC

- 2 speed motherboard with keyboard selectable 4.77 MHz and 8 MHz modes. selectable 4.77 MHz and 8 MHz mod
  640K memory on motherboard.
  8 expansion slots.
  135 wait power supply.
  1 360 helf-height floppy wicontroller
  LED indicator lights and speaker.
  Besutiful high quality cabinet.
  5150 style keyboard. 5151 Optional

\$50 off this price

Blaze along with up to 70% increase in processor speed over normal PCs. Yet, easily switch to 4.77 MHz when specialty programs require it. Runs all major IBM software in Turbo mode. One year warranty.

TCS Turbo Business Computer MHz Turbo Speed. Compatible with the IBM-AT

\$1545



8 MHz. 33% faster than standard IBM-ATs.

- 80286 Microprocessor
  1 mg. memory installed
  1.2 mg. floppy drive
  Floppy/Hard AT controller
  192 watt power auguly

- 192 watt power supply 8 expansion slots
- m Clock/calendar w/battery AT style keyboard
  AT style keylock cabinet
- Set-up software

AT Multifunction Card . \$179 2 serial, 1 parallel ports. Will hold up to 2 Meg. of memory (2048K).

256K Memory. . . . . . \$29

2 meg. (8 sets) . . . . . \$232

Orchid TINY TURBO 286 . . . . . \$490

Supercharges normal PC/XTs to run faster than an AT. Enjoy lightning AT speed with this super half slot stard accelerator. Assures 100% IBM-PC competibility by keeping 9088 processor in system to switch on when needed. Hard Drive Kits

with each Kit: WindowDOS Software! Resident DOS Utility gives instant access to DOS functions from inside your program. A \$50 value.

10 meg. \$399 20 meg. \$419

\$439

30 meg. \$575

UNAUTHORIZED DATA ACCESS SECURE YOUR COMPUTER IN MINUTES KABLIT \$49% PHYSICAL SECURITY APPLE II DISKETTE AND DATA FILE STOPPER™ \*39\* MACINTOSH POWER SWITCH LOCK FILES AND DIRECTORIES ARE DEC MICROS ENCRYPTED MODE FOR EASE LASER PRINTERS TYPEWRITERS BLOCKS COVER SCREWS MONITORS OF USE ON-LINE HELP RESTRAINS PERIPHERALS CONFIDE" 149 ALLOW ENTIRE SYSTEM TO BE 0 SEGURED TO DESK NO MODIFICATION TO SYSTEM REQUIRED INSTALL WITH STANDARD SCREWORIVER MENU DRIVEN FILE BY FILE ENCRYPTION SST OR DES ALGORITHM EASY OPERATION -JUST TURN THE KEY VDRIVER

VStems Technology Into
Southwest Avenue
P 0 Box 274
P 0 Box 274
P 0 Box 274
P 10 Box 275
R 10 Box 27 BLOCKS CRT PORT SECURES SYSTEM COVER

#### Repair PCs

AID/88 is a professional in-circuit tool used in repair of IBM PC and XT system boards ... also 8088-based clones and adaptor cards. \$2995

DAIR

3440 Kenneth Drive Palo Alto, CA 9430: 415 - 484 - 7881

Volume Supplier To Corporate Buyers..

1-800-624-4031 In Texas Call: 512-331-6700

#### MICRO DIRECT SHOPPER ORDER FORM

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

Sections: Please be sure to specify the section you want. Micro Direct Shopper advertisers must offer to sell their products and services by mail or phone orders only.

Copy: We'll typeset your ad at no extra charge. Please attach clean typewritten copy. Figure about 25 words to a column inch, not including headlines. Any special artwork should be enclosed with your ad also. Logos must be submitted on white bond paper for best reproduction

Ad size desired: \_\_\_\_\_ columns wide by \_\_\_\_\_ inches deep Issue Date(s): \_\_\_ Section: \_ Company: \_\_ Address: .

Telephone: . Send this form to:

COMPUTERWORLD
CLASSIFIED ADVERTISING
Attn: Liss Whittemore
375 Cochituate Road
Box 9171
Framingham, MA 01701-9171



The #1 obstacle for new PC users is the keyboard. The Pc KEYBOARD CHART allows users to quickly and easily understand the functions of the ARROW and SPE-CIAL keys. Erasable writing surface (free matring pen) allows you to label keys for your applications. Send 39.65 – 3.50 ehpping

THE LEARNING CIRCUIT
4550 Hollywood Blvd., Suite 170
Los Angeles, CA 90027
VISA and Mastercard please call:
1-809-628-2828, Ext. 510

**NEVER KNOWINGLY LINDERSOLD** 

tom prices.
NDRC XT 50
Serial, Parallel & Game ports,

.. \$ 129.00

ber ..... \$ 299.00 8087-3 MathsCoprocessor ...... \$ 129.00

(Prices quoted FOB Dallas, Ship UPS)
Vien & MasterCard at 3%
D.R.C. (214) 750-9889 N.D.R.C.



COMPUTER SOLUTIONS FOR YOUR BUSINESS

ncializing in AT&T Single &

UNIX/XENIX or DOS Customized Systems Manufacturing, retail point-of-sale, financial, etc.

ATHT COMPAGE IBM.

FCG Information Systems Inc. 11033 E. Rosecrans Ave. Norwalk, CA 90650 213-829-8891 CA 800-624-2499 Nat'l 800-523-1789

dBase III Plus

\$369

MICRO DIRECT SHOPPER

MICRO DIRECT SHOPPER

\$319

MICRO DIRECT SHOPPER

Symphony

\$449

MICRO DIRECT SHOPPER

\$369

\$219

MICRO DIRECT SHOPPER

\$209



#### DATA ENTRY SYSTEM FOR PC'S

408/458-9938

RODE/PC is the top-rated PC data entry software. Fastest and easiest to use. Extensive features to meet every data entry require-ment. Stand-alone and LAN versions. High-speed data entry keyboard available.



#### DPX, Inc.

20823 Stevens Creek Blvd. Cupertino, CA 95014 (408) 973-9292

#### PAYROLL



#### IBM REPAIRS

PC AT XT

One Day Service

**Call Now** (305) 944-0042

DISK CONVERSIONS

Converting documents is our specialty! All formatting codes are converted intact. For further information

and a free test conversion Call: 213/421-3055

CAMSON 4148 Norse Way Long Beach, CA 90808 Custom Send Cables Cat

RS232 • Parailel • 422 coaxial • Dual Wang • 449 Twinaxial • Ethernet Mod Plug • V.35 • Berg Ribbon • Din • RCA Connector Parts Bulk Cable • Tools

Communication Cable Company P.O. Box 600, Wayne, PA 19087 215-644-1900

## 9600 BAUD

Dial-Up **Error-Correcting** MODEMS \$995

CALL (703) 620-3900 TO ORDER YOUR UPTA 96 MODEM

EVI/Fastcomm Data Corp. 
 RESTON + VIRGINIA

#### DATA ENTRY **EMULATOR**

Full speed heads down data entry with two-pass verification for the PC/XI/AT and compatible. Easy seren formatting by your data entry operation minutes. Loaded with features like: auto dupe and skip, verify bypass, constant fields, range checks, table lookups, full screen paging, and field totals. Fully menu-driven only \$395. Call for free 30 day trial period.

COMPUTER KEYES way, Washington 98020 (296) 776-6443

- Lifetime Warranty
- U.S. Manufacturer
- 100% Certified
- **Includes Tyvek Sleeve**
- Reinforced Hub
- **Write Protects**
- **Includes Labels**

408 496-1022 1 (800) 245-3111 We also carry and AT Media

SAME DAY SHIPPING

Larger Quantities Mean Lower Prices! Duplicating Services Available

National Computer Consulting Inc. • 3375 Scott Blvd. Suite 422 • Santa Clara, CA 95054

Multisync \$899 \$599

WEW EGA \$379 Princeton HX-12E \$539

JRAM AT-3 \$239

\$799

# **BUY - SELL - SWAP**

#### Here's Everything You Always Wanted From Data General. But Couldn't Get.

We buy, sell and swap Data General gear of all

we ouy, sen and swap Data General gear or all kinds—processors, peripherals, storage, communications, etc. But we're also authorized distributors for higher-performance DG-compatible equipment like Spectralogic controllers and C. Itoh and NEC printers, as well as for CDC, Fujitsu, Zetaco, MICOM, FACIT, Data Products and Kennedy.

We've got field service at a fraction of DG's prices. And depot service with immediate replacement of defective parts. As well as



Call or write Hanson Data Systems 60 Brigham St., Mariboro, MA 01752 (617) 481-3901 Outside Mass. (800) 225-9215

Data General's Only Single-Source Second Source



#### MISSISSIPPI CENTRAL DATA PROCESSING AUTHORITY

nerral Request for Proposal No. 1100, due esday, July 8, 1986, 3:30 p.m. This is a neral RFP for the acquisition of communi-ting electronic typewriters for the State of ssissippi during fiscal year 1987.

General Request for Proposal No. 1101, due Tuesday, July 8, 1986, 3:30 p.m. This is a general RFP for the acquisition of video dis-play word processors and peripherals for the State of Mississippi during fiscal year 1987.

General Request for Proposal No. 1102, due Tuesday, July 8, 1986, 3:30 p.m. This is a general RFP for the acquisition of shared lo-gic/shared resource word processors and peripherals for the State of Mississippi during fiscal year 1987.

neral Request for Proposal No. 1103, due sday, July 8, 1986, 3:30 p.m. This is a eral RFP for the acquisition of shared data work services for the State of Mississippi ing fiscal year 1987.

General Request for Proposal No. 1105, due Tuesday, July 8, 1986, 3:30 p.m. This is a general RFP for the acquisition of Burroughs compatible devices for the State of Mississippi during fiscal year 1987.

General Request for Proposal No. 1107, due Tuesday, July 8, 1986, 3:30 p.m. This is a general RFP for the acquisition of Four Phase compatible devices for the State of Mississippi during fiscal year 1987.

General Request for Proposal No. 1108, due Tuesday, July 8, 1986, 3:30 p.m. This is a general RFP for the acquisition of Honeywell compatible devices for the State of Mississippi during fiscal year 1987,

Lisa Winstead or Colleen Downii State Central Data Processing Authority 601/359-1395

#### WANT TO BUY DatagraphiX **USED 4560/80 COM RECORDERS**

Please call R. Gregory 415-854-2306

ZYTRON, A Company of the Dun & Bradstreet Corp





(800) 331-8283 (213) 306-9343 Ocean Computers, Inc. 8055 W. Manchester Ave.. Ste 525 Playa Del Rey. CA 90293

Sale Or Lease 3081 K32x24





- BUY
  - SELL
    - SWAP

Well-Equipped To Serve You In Buying Or Selling

- HARDWARE
- SOFTWARE
- COMPUTER TIME & SERVICES

Over 500,000 computer people read COMPUTERWORLD every week.

So placing an advertisement with us is going to help you take care of your computer-related business.... very quickly.

Call 1-800-343-6474 (in Mass.) 617-879-0700 BUY SELL SWAP

**Providing** the BEST a BETTER WAY.



**BUY-SELL-LEASE** S/34 · S/36 · S/38 43XX · 30XX SERIES/1 **NEW OR USED** 

HONSTON (713) 784-6880 RANSAS CITY (868) 238-3048 LITTLE ROCK (501) 224-6242

CDLR =



Who do you call on first for your data processing and telecommunications needs?

#### CMI SPECIALISTS

3081, 3083 3084 FOR SALE OR LEASE

DEC/VAX 780's, 785's FOR SALE OR LEASE

Encino, CA (818) 789-0113 Laguna Hills, CA (714) 951-3200 Sacramento, CA (916) 443-7511 Miami, FL (305) 442-2968 Tampa, FL (813) 228-7000 Atlanta, GA (404) 256-7942 Chicago, IL (312) 620-4400 Boston, MA (617) 367-5755

Absecon, NJ (609) 645-7282 Flemington, NJ (201) 782-3878 Monmouth Beach, NJ (201) 222-0750 Cleveland, OH (216) 292-8142 Lebanon, TN (615) 449-6633 Dallas, TX (214) 869-3111 n, TX (713) 780-7459

Vancouver, British Columbia (604) 685-6196 Toronto, Ontario (416) 928-3400 Montreal, Quebec (514) 871-1121 Nyon, Switzerland Telex: 27209 Paris, France Telex: 214093 Frankfurt, West Germany Telex: 4170499 London, England Telex: 848980

Upgrades



**CMI Corporation** 

CMI Financial Services Group 2600 Telegraph Rd./P.O. Box 2026, Bloomfield Hills, MI 48303-2026 (313) 456-0000/TWX 810-232-1667 CMI CORP. BDHS

Member ASCD and CDLA

# THE COMPUTER

(In CT. call 203-661-4200)

You don't have to wait. Call us now for the best rates going on IBM systems . . . from 4381's to 3090's and everything in between. Ask for Thomas McShane.



Randolph Computer Corporation idiary of Bank of Boston • 537 Steamboat Road, Gree

# Dataproducts

Factory \*Remanufactured & additioned Printers from Dataproducts

	management and a company	
B1000	1925 LPM Band Printer	Call
372000	2000 LPM Band Printer	Call
8800 Series	Matrix Printer	Call
2290	500 LPM Drum Printer	\$1495-2995
2260	660 LPM Drem Printer	\$3495-4495
2298	900 LPM Dram Printer	\$3995-6495
M100	120 CPS Label Printer	82595
14120	180 CPS Matrix Printer	\$1495
DP55 -	55 CPS Daisy Wheel Printer	\$ 995-1495
480	PC Matrix Printer	\$ 295
7-50	An CFS Thermal Printer	\$1150-1405

Call (818) 888-4291 and ask for Varad Raj

I - 36 - 38 - SERIES 1 - 4331-4381 ALL PERIPHERAL EQUIPMENT ALL UPGRADES

CALL: 800-238-6405 IN TN: 901-372-2622 INNC: 919-884-0879

0 3 COMPUTER BROKERS INC. 2978 SHELBY ST.

MEMPHIS, TN 38134 "SINCE 1974"





OMPUTER SYSTEMS 5105Q BACKLICK ROAD, ANNANDALE, VA 22003

Or Sublease

3380 Disks

All Models

(800) 821-0229 (818) 986-2411

Unilease already has a second-user 3090. Of course.

(212) 285-1846 New York Orlando Los Angeles London Dissoldori Peris

BUY SELL SWAP

BLIY SELL SWAP

BUY SELL SWAP

\*Buy \*Sell \*Lease Up to 40% SAVINGS on \*

IBM. Displaywriters Guaranteed Acceptable for IBM Maintenance

FEATURES & UPGRADES 5215-5218-6361

SYSTEM /23 DATAMASTERS

6670 PRINTERS 5525 OFFICE SYSTEMS 5219-5253-5258

SYSTEM/34/36

CDB FINANCIAL, INC.

We Buy & Sell

DEC

Systems

HARDWARE BUY-SELL-LEASE

SERIES-1

S/34 • S/36 • S/38 S/23 . 4300 . POS

AMCOM

5200 W 73RD ST NNEAPOLIS, MN 55435

MINNEAPOLIS, MN 55435 612-835-4737 800-328-7723

Digital

esale

call:713

445-0082

600 Kennck Ste C22 Houston, Tx 77060

3520 DILIDO ROAD DALLAS, TEXAS 75228 214—324-3491. Member NOMDA-CDLA

PLIV SELL SWAP

BLIV SELL SWAP

Inflation Fighters

**Quality & Savings** 

Slightly used, Money Back Guarante Full Reets. All External Labels Remov Guaranteed for use at 1600 BPI throu 6250 BPI.

2400' Reel \$4.95 ea. 1200' Reel \$4.50 ea. 600' Reel \$3.75 ea.

All Tapes with Hanging Seals

We pay freight on orders over 200 tapes
All orders shipped within 48 hours.

Call or Write

Computer Tape Mart 44A Seabro Avenue N. Amityville, New York 11701

[516] 842-8512

#### IBM SPECIALISTS

SELL • LEASE • BU

- · New and Used

- Immediate Delivery
- Upgrades and Features Completely Returbished

800-251-2670

CMA

COMPUTER MARKETING

P.O. BOX 71 • 610 BRYAN STREET • OLD HICKORY, TENNESSEE 37138

Data General Users
IN NEW YORK, NEW JERSEY AND CONNECTICUT



DISASTER RECOVERY **FACILITIES** 

**Facility Management Plans** 

FULLY MAINTAINED MY10000 AND MY8000 SYSTEMS, COMMUNICATION NETWORKS TO ACCOMMODATE HUNDREDS OF USERS, EXPANDABLE SYSTEM CAPAG EXCLUSIVE OR SHARED EQUIPMENT USAGE RIGHTS.

Systems inc.
SALE, LEASE AND SERVICE OF Data General EQUIPMENT

EAST COAST (516) 467-2500

NEW YORK: 761 Costes Avenue, Holbrook, NY 11741, 516-467-2500 Telex #510-222-0682 CALIFORNIA: 2322 Fifth Street, Berkeley, CA 94710, 415-848-9835







3704 3705 3725 BUY . SELL . LEASE Call Toll-Free

800 532-7532 nnesota Call 612/944 9161

Centron DPL Company

#### Stratus XA400 Computer

Includes 4 Mb Duplex Module (2) 143 Mb Disks (1) 448 Mb Disk Stratanet 14 CRTs

Along with all supporting hardware and software including TPF transition processor, Cobol compiler word processing with dictionary sales order processing and manufacturing systems and more descriptions of the processing and manufacturing systems and more descriptions.

ailable For Immediate Lease Call George Carr (203) 725-6730

#### BEST PRICE **BEST SERVICE** BEST DELIVERY WHETHER YOU BUY, SELL, OR LEASE LARGE

ELAS PAR INTERNATIONAL



LEAS PAK SOFTWARE SERVI

ONE SOURCE SOLUTION

P.O. Box 759, Hurst, TX 76053 In Texas 1/800/LEAS-PAK

The height of the year in Computers.

88

And the height of advertising exposure in Computerworld Classifieds

#### THE NATIONAL COMPUTER CONFERENCE

You've got 2 chances left to take advantage of it with us--- the Show Issue (June 16th) and the Wrap-Up Issue (June 23rd). The NCC issues will have a readership over and above our usual 600,000+ readers. It's time to make one of your smartest advertising moves

Give us your advertisement. We have the classification to cover it:

**Position Announcements** Buy - Sell - Swap Software for Sale Software Wanted Time & Services

Bids & Proposals Auctions Publications minars Real Estate

\* The Bulletin Board \* Micro Direct Shopper

The open line rate is \$11.55 per line and the minimum ad size is 2 column inches (1 column x 2" at a cost of \$323.40)(\*except for Bulletin Board and Micro Direct Shopper) Send us camera-ready copy or copy to be typeset by us at no extra charge. Enclose any logos, artwork, or borders that you want to use in your ad. And if you are a first-time advertiser, please send payment along with your ad. please send payment along with your ad.

Space in the Bulletin Board and Micro Direct Shopper are sold differently please call for further information/ rates.

Send all materials to Classified Advertising, COMPUTERWORLD, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171. For further information please call: 1-800-343-6474, or in Massachusetts (617) 879-0700.



IS THE SOURCE FOR SERIES/1

- BUY · SELL LEASE

**NEW OR** USED

P.O. BOX 240297 MEMPHIS, TN 38124 300-238-3098 or 301-767-9130

# The Bulletin Board

Buy · Sell · Lease

#### PRINTERS

#### FOR SALE SPERRY UNIVAC 0777's

Off-Line High Speed aser Printing Systems ranteed for Sperry Maintel
Call (212) 949-8700

#### MODEMS

#### FOR SALE CODEX CS48FP CS96FP

"Unbelievable Prices"
Call Chuck 800/331-8283
213/306-9343

#### MISC. SYSTEMS

#### **Diebold ATMs**

Model 910 Walk-Up

Call Tracy Kalberer At ovident National Leasi (215) 585-6959

#### HEWLETT PACKARD

#### HP3000

BUY " SELL " RENT " LEASE ors " Peripherals " Sys **Memory Special** 

30161A 1 Mb Memory For S/4X \$6,500.

Immediate Delivery Subject to Availability Guaranteed to Qualify for HP Maintenance ConAm Corporation (800) 643-4954 (213) 829-2277

#### HP 1000 . 3000

ENCORE (213) 452-9117 Telex 756927

#### MISC.

#### NEW & USED RAISED FLOORING

Cuality Installati ED COMPUTER FLOORS One Charles Street Mestwood, NJ 07675 (201) 986-8200 Telex #13-5076

MOTOROLA FOUR-PHASE FOR SALE (1) Model 1/85's (5) Model 1/85's Terminals and Terminals

#### MISC.

#### Xerox 9700

Buy/Sell/Lease

Marketex 800/426-4341 In CA 408/241-3677 Contact Ken Hudson

Almost new, Voice Technologies automated telephone order entry system, with voice response, Ideal to support or enhance order entry department in high volume environment. Can function as stand elone unit or be interfaced with host computer. Original cost 40m asking 20m. Call Ray at 201-480-1200.

#### WANG

BUY - SELL
MVP/LVP . OIS . VS . PC
SYSTEMS IN INVENTORY
VS-45 ● OIS ● VS-100
GENESIS
EQUIPMENT MARKETING
GEM
(602) 277-8230

#### THE RIGHT EQUIPMENT RIGHT NOW THE RIGHT PRICE ICA..THE RIGHT CHOICE

founded 1981 by ex-Wang employees (404)977-4388 or (800)241-3159

# Buy e Sell Used Wang Equipment arteef For Wang Mantenance Holson Associates Inc. Windy Rill Road, Suite 253 Marietta, GA 30067 Call: Richard Holley or Carole Senson (404) 880-1700

Call

to place vour ad today

(800) 343-6474 (617) 879-0700

#### HONEYWELL

#### HONEYWELL SPECIALISTS LEVEL 6 DPS 6 SERIES 16

<ul> <li>Complete Minicomputer Line - Ne and Lined</li> </ul>
* All Peripherals and Terminals.
* Upgrades and Features
* Depot Repair Capability
* Honeywell Maintenance Guarantee
* Immediate Delivery - Low Prices
* Complete Refurbishment

617-393-6839 TWX 710-347-7574 au Computer Services Since 1974 100 Beerloot Rd. oro, Massachusetts 01532

#### LEVEL 6 AND DPS6 USERS

Systems - Peripherals - CRT's Memory - Controllers - Cables Large softwere staff C.D. Systems Inc. 1-800-331-2310

#### HONEYWELL

#### HONEYWELL - LEVEL 62 FOR SALE

Entire System 196K Mem, 4 29MB drives 2 - Displays, 400 LPM prints + more Resurrection Catholic Cente (205) 263-4221

#### DEC

#### FIRST ON DEC FOR SALE

DEQNA-M \$ 87	
DEUNA-AA2.80	00
DFO3-RC47	75
DFM16-AC3.60	'n
DMP11-AD 2.97	
DR11-W1,36	Š
H9652 MA 2.45	20
LA120 BA1.25	50
MICROVAX II'sCAL	1
PRO350 D22.70	00
RA81-AA12.50	X
RA81-ED42.00	
RP07-AANew 12.00	
RUA81-EA45.92	
VT220New 74	15
107040	77
VT2401,68	
VT240 DEMO1.07	75

CALL

(800) 222-ICEX (303) 666-5400 ICEX, INC. 740C SOUTH PIERCE AVE. LOUISVILLE, CO 80027

#### **Merida Trading Group**

New
RA81AA\$12,500
RA60AA\$12,500
RA81JA\$52,000
750 Memory \$1,450
780 Memory \$1,450
MS11TB\$1,300
VAX 750 CPU Used Call
VT220 A, B & C Recon. \$750
Used 750/780
Memory\$1,000

Memory...\$1,000 H9642 Cabinets (2)...\$1,000 155 New Boston Street Woburn, MA 01801 (617) 933-6790

VAX-11751 Unused	\$18,900
Micro 1173 System	
Unused	\$9,800
LN01-AB Used	\$4,500
LN01-AC Unused	\$7,900
<b>RQC25-AA Complete</b>	
<b>RUC25-AA Complete</b>	\$2 500
RP07-AA	\$5,900
FP780-AA	
FP730-AA	\$750
RM05-FA Unused	\$3,900
RM05-AA Unused	\$3,800
TK25-AA	\$750
1140.504	

We Pay Cash For Your Llead/New DEC Equipment

ntinental Computers (213) 839-2284

#### **DEC SPRING SPECIALS**

11/34A CPU Set\$750
11/44 CPU Set KD11Z\$3,900
DL11-W\$185
FPF11\$875
FP11A\$695
HSC5X-CA85,700
KK11-A\$475
MF20-M\$4,400
MS11-LD\$375
MS11-MB\$375
MS630-BA\$2,900
MSV11-PL\$695
VAX 4MB MS780-JD\$5,900
VAX 4MB MS88-BA\$11,300
W-W-W

DEC NEW & USED BUY - SELL - EXCHANGE Systems • Processors • Memory Options • Peripherals • Modules LAKEWOOD COMPUTER CORP. 452 Link Lane Pt. Celline, CO 80834 (303) 483-4466

#### DEC

LA120 (Recon.) \$795 VT220 (New) \$825. DECMate II (New) \$2295. KDF11BA (New) Digital Computer Resale (713) 445-0082

#### LOW MILEAGE 11/750

4 MB, FP-750, 2 RM05's TE 16, DZ 11E (16 line) more VAX/VMS Licerse, Media, Doc FORTRAN ditto Available now, can be seen running in Detroit area. By owner (313) 541-0535

#### BUY . SELL . TRADE

1170 CPU-stKDJ11-AA MSV11-JC 11725 LA120-BA MSV11-PL BC26V-50 MS11-PB MSV11-PL ABC26V-80 MS750-CA MSV11-QC DZ11-DP MS780-CH RA81-AA H7140-AA MS780-FA TU80-AA NEW YORK COMPUTER EXCHAN (516)752-8666 (800)645-91

Sell Your Product

**BULLETIN BOARD** 

#### IBM

#### For Sale IBM 1800 System

2	1053-003	Printers
1	1442-007	Card Unit
1	1443-002	Printer
1	1627-001	Plotter
1	1801-2CB	CPU
1	1803-02D	Core
1	1826-001	Data Adapto
8	2311-001	Disk
2	2841-001	Controller
8	3277-002	CRT

#### Available 05/01/85 - Toledo, OH Call Sue Russell (215) 977-6246

#### SERIES/1

BUY - SELL - LEASE

New, Used, CDC, Features Xerxes Computer Sales 00/328-3884 612/936-9280

#### 34-36-38

Systems,
Peripherals & Upgrades
Guaranteed Quality Service
Special Reduced Prices
New and Used Equipment
tyn Computer Systems,
800-828-4227
in VA (703) 642-1950

#### 3178, 3179 3278, 3274

W Other IBM Units Available Call Penny 800/426-4341 In CA 408/241-3677 Marketex Computer Corp.

#### FOR SALE SYSTEM/36

5380 CPU Model A21 (30MB, 128K, Magazine) and 5224 Model 2 Printer. IBM List \$31K + Buy for \$24K or Best Offer (913) 749-3367 James Hamoraly

Call Paul Blain (416) 821-444 Soott Computer Leasing

#### IBM

#### 3276-12 Controller

#### 3287 Printer \$150. Per Month

General Systems Corp. Jan Roberts (313) 626-6200

#### SALE/LEASE

#### 3380-AA4 3380-B4 3880-3

w/8170, 8171 Call Howard King (914) 238-9631 Computer Merchants Inc.

# S/38 S/36 S/34 SERIES 1

**BUY - SELL - LEASE** Systems, Peripherals & Upgrades Source Data Products 415/326-7333

#### For Sale

(2) 3880 Model 3 Storage Cor High Serial Numbers

rce Equipment Les (602) 264-1873

#### Fox Computer Sales Buy . Sell . Rent . Lease IBM

DP & GSD W.T.B.: Used Equipment (216) 449-5205

#### **Want To Buy** System 38 System 36

(713) 627-7117

SALE/LEASE S/38

Models 6G1 & 9YA Available July

Call Ron Gibb (914) 238-9831 Computer Merchants Inc.

#### FOR SALE

#### 3380-AA4 3380-B04 3880-3 (H/SN)

Call Chuck 800/331-828 213/306-9343

#### Model 18 - 4 Mb

Immediate Availabilit Must Self Or Leas ce Data Prod 415/326-7333 Call Bob Losey

#### SALE/LEASE

#### 4331-L2 4361-L5

Will Reconfigure Peripherals Available Call Bill Hegan (914) 238-9631 Computer Merchants Inc

#### \$/38 **Memory Upgrades**

Immediately Available EMC Or IBM (713) 627-7117 (212) 279-4467

#### 3608s 3612 3610s 3601

Call Tracy Kalb At Provident National Leasing (215) 585-8958

#### **IBM**

#### For Sale Or Le 3880-3 3380-AA4 3380-B04

#### tonnet Computer Co. (512) 926-3900

S/38 5381-9G1

Available Immediately Self Or Lease neo Computer Corp. (213) 539-7290 Call Steven Mack

#### For Sale **IBM 3180**

Model 210

\$1,700. Each Call David (800) 821-9926 (408) 462-1941

#### For Sale

IBM System 34 Model 5340-E35 128K/128MB CPU, 4 Display Stations

Was on IBM Maintanance

# Call Irl Grodsky enstruction Compa 12121 291-3400

Duplicating/Copier Large Capacity Machine 100,000 Copies per Month Excellent Condition Guaranteed Maintenance IBM List Price \$28,900 SALE PRICE \$6,500 Leasing Available Cell (201) 238-7550

#### IBM S/36

Used 826
769X, 900MB Disk
MLCA w/4 Lines
WI consider trade, les
and/or reconfiguratio
Amcom Corporatios
1-800-328-7723

#### Series/1 Components

4978 Display Stations 4978 Display Stations 4974 Printers 4982 Disk Storage 4982 Expansion Units 4985 Processors Cell Barbara Polus (213) 933-7581 ARA Services, Magazine & Book Dis

#### PRIME

LARGE SELECTION OF USED PRIME COMPUTER SYSTEMS ...SAVINGS TO 50% ...SAVINGS TO 50% Peripherals also available 1st SOLUTIONS, INC. 2001 EAST CAMPBELL AVE. PHOENIX, ARIZONA 85016 (602) 957-0999 ASK FOR DON OR MATT

TBI - the oldest, largest and most ex-perienced supplier of third party peri-pherals, memories and controllers for

BUY . SELL . LEASE . RENT 800-222-DISK 800-421-4135 Timesharing Services, Inc., 4080 Woodcock Dr., Jacksonville, FL 32207

> More Bulletin

Board on the

next page

The Bulletin Board

The Bulletin Board

The Bulletin Board

#### DATA GENERAL

#### NEW D.G. C.R.T.'s

Computing Syst (612) 935-8112

#### BURROUGHS

#### **BUY SELL LEASE** BURROUGHS

B-20 to B-7900 SPECIAL 207 DISK (10 Units) B900 DiSK PACK (206 Style) Subsystem

#### DEPOT MAINTENANCE

**Computer Provisions** (216) 248-7878

#### BURROUGHS

BUY . SELL . LEASE

- ns \* Processors \* Peripherals
  - All BX500 & BX900 Seriel
     All "A" Series
     All Peripherals
     All Terminals
     All Convergent Technology

"June Specials" B9246-12/13 1250 LPM Printer B9246-6 650 LPM Printer B6925-B5925-B1985 Burroughs B20 Memory Upgrade B20-B21-B22-B25-B26 etc. Depot Maintenance

#### THE BULLETIN BOARD

#### A Low-Cost Way to Sell Hardware and Software in Computerworld

#### What is The Bulletin Board?

It's a classified section in Computerworld designed especially for the selling and buying of individual pieces of hardware in a convenient, low-cost format. It is especially suited to companies that have a piece of used equipment they want to sell. For one low price, you can inform more that half a million Computerwold readers around the country of your equipment's availability.

#### How Does The Bulletin Board Work?

Bulletin Board ads come in standard units (one column wide by one inch deep) and standard typefaces. (Units may be combined to produce deeper ads, but one column is the maximum width and no units of less than one inch are available.) Ads are arranged under headings (such as "IBM", "DEC" or "Printers"). The headline of the ad is set in larger, bold type, and should contain the standard equipment identification. The body copy should describe the equipment very briefly and give the person to contact. This is all the information an interested buyer needs to follow up. No ad should have more than one piece of equipment or software.

Price for each standard unit is only \$160. There is an one unit minimum and no fractional units available.) Anyone can place an ad, but no agency commissions are paid, no quantity discounts allowed, and no credit toward rate is given for contract advertisers who advertise in other sections of Computerworld. It's a simple and effective system for buying and selling hardware and software and software.

#### How to Place an Ad in the Bulletin Board.

Ads are accepted in the mail, by phone or by telecopier only, no camera ready ads will be taken. Ads can be accepted up until the Monday before issue (7 days in advance of issue date). You should write out your ad before submitting it. (The standard size will hold approximately 25 words of copy.)

Once you've written your ad, send it in with the coupon below or call one of our ad-takers. (If your company has never advertised with us before we

Remember that all ads are standard. No special typefaces, no borders and no logos are allowed. Ads are set on a six-column page in our classifed section under the heading "The Bulletin Board." We assume no liability for errors beyond the price of the ad in the case of material errors.

#### ORDER FORM

#### COMPUTERWORLD **BULLETIN BOARD**

Issue Date(s): Classification:

Address: .

Send this form to:

#### COMPUTERWORLD BULLETIN BOARD

375 Cochituate Road, Box 9172 Framingham, MA 01701-9172

617-879-0700

# TIME & SERVICES

#### SOFTWARE WANTED

**Litton Computer Services** FULL SERVICE COMPUTING

IMPESHARING BLOCK PROCESSING
\*NATIONWIDE NETWORK MICRO/MAINFRAME LINK
\*STRATEGIC PLANNING FORECASTING

LET US SHOW YOU HOW WE CAN REDUCE YOUR DATA PROCESSING COSTS

CHICAGO (312) 298-9305

OR FOR MORE INFORMATION WRITE OR CALL:

6 Kingsbridge Road, Fairfield, New Jersey 07006,
Attn: Dominick Ciminello, (201) 575-2800

#### COMPUTER TIME RENTAL

DOS/VSE - ICCF All Shifts Available 3370 Disk, 3420 Tape 800/1600 Density

2540 Reader/Punch

Reasonable Rates Contact: Al Palmo

Restamatic Data Services (212) 997-1439

#### ICOTECH

novative Computer Technique DATA PROCESSING SERVICES IBM 3081 DEC-10 VAX 8600

the ICOTECH

#### **DATA CENTER** SERVICES

- MILLENNIUM + NOMAD2
  OS/MVS/SP + TSO/SPF
  VM/370 + CICS
  DOS/VSE/SCP + IMS/DBDC
- \* RJE

Info Center Products
Access By Micros
EXCELLENT SERVICE LEVELS
COMPETITIVE RATES
VOLUME DISCOUNTS

#### BURNS SERVER INC.

MILLENNIUM is a registere idemark of McCormack & Di

NOMAD? is a trademark of DGB COMPUTING SERVICES. INC

Tell Us About The TIME & SERVICES

You Have To Offer...Here In COMPUTERWORLD's Classified Pages.

## **VAX TIME**

HOOSE THE PLAN BEST FOR YOU A @ 5¢ CPU SEC & \$2 CONNECT H B @ \$12 PER CONNECT HOUR ONTH & 10 MB DISK

O CPU CHARGES ON PLANS B & C.



The Phoenix Police Operation is soliciting in-formation from other law enforcement again-cies and software/lumkey vendors identifying organization of our size (City oppulation 68), 000+ Department employs 2,3641, Vie 68), 000+ Department employs 2,3641, Vie 100,000+ Department employed and the porting, Case Management Processing, Chrise Analysis, Traffic Accident Reporting, Venicies, View Roborsy and Uniform Chrise Reporting, View Roborsy and Uniform Chrise Reporting,

#### COMPUTER TIME

West Coast

VM/CMS-DOS/VSE-CICS First & Second Shifts Available 3370 Disk, 3420 Tape 1600/6250 BPI 3203/4245 Printers

Continental Holding Corp. (415) 827-2668 Contact Bob Grant

THIS

[Inquire at Classified Advertising Dept.]

A Tradition of

know the key to remaining a world leader in the competi-tive field of graphics commu-nication. People. And we're looking for some who will accept the challenge we've undertaken...to continue applying advanced tech-nology to the development of the finest, most cost-effective graphic arts and text management systems and products available in the world. Join Compugraphic. And become part of our

Compugraphic is located off Route 128, "America's High Technology Highway," just 20 minutes from all the educational and cultural resources of Boston and close enough to the many recreational opportunities of New England's beautiful New England's beautiful mountains and beaches.

## TECHNOLOGY LABORATORY GROUP Diagnostic

You can have it all! Satisfy your desire for diversity while becoming a key contributor on this crucial team.

- PC based platform
- projects
   Design ign, code, debug and
- document software

  Assembly and other high level languages which will interface to PC DOS
- Integrate software mod-ules into an overall diag-
- nostic project
   BSEE/BSCS, 3-5 years' experience in diagnostics or hardware design or coding of hardware drivers helpful

#### Senior Software Engineers

Look ahead to the future and beyond! Join the leading team in graphics and develop vour future!

- 3D-graphic standards (IGES-GKS)
- "C" language
   UNIX<sup>TM</sup>
- Assist in evaluation of 3rd party software packages BSCS/MSCS
- 4+ years' experience
- ect leader experience
- a plus

For the preceding 2 areas, please send your resume to Mike Walsh.

#### DEVELOPMENT Sr. Software Engineers

We have the opportunities to match your abilities! You need a Bachelor's degree and at least 4-5 years' software experience

In Systems: develop system utilities, message sub-systems, shells and system administration software UNIX<sup>TM</sup> environment.

In **Graphics**: design and implement a graphics/image processing feature and provide technical expertise to a

#### Software Engineers

Here are the experience areas from which tomorrow's leaders will come. A Bach-elor's degree and 2 years' "C" programming will get you started!

to all document systems

Text Editing: work on a 4th generation WYSIWYG system with true font representation.

Enhancement Engineering: develop foreign language document composition

Systems: develop communications and driver software for a PC/AT clone

For the preceding 2 areas, please send your resume to Dave Stevson.

Compugraphic Corporation offers excellent starting salaries, a full range of company benefits, promotions from within, profit sharing and pension plan.

Please send your resume to the appropriate person in-dicated above. Compu-graphic Corporation, Dept. CW62, 200 Ballardvale Street, Wilmington, MA 01887. An Equal Oppor-tunity Employer, M/F.



Creating the Future of Graphic Communications

#### MANAGER MARKETING COMPUTER SYSTEMS

# Versatile Professional With Both MIS and Non-MIS Work Experience

If you posses both technical MIS expertence general business acumen...Mueller Co. wants you. You will be challenged with implementing strate-gies and tactics in support of Corporate-wide mar-keting systems for our \$300 million, multi-location business. We are an international leader in the manufacture of flow control devices for a range of industries: join us at our headquarters in Central

A minimum of 7 years progressively responsible experience is required, both within and outside the experience is required, both within and outside the MIS field. Confidence, leadership skills and communication abilities are musts. A Business degree or equivalent is required; you must be available for about 50% travel. Additionally, you should be familiar with the following technical environments:

- IBM 4300 IBM System/36 VM/VSE
- VTAM · CICS
- . DL/1

Mueller Co. will provide you with a competitive sal-ary and complete benefits, (including relocation as-sistance). If you are the multi-faceted leader we seek, send your resume or letter of qualification to: Loyd Hawkey, MUELLER CO., 500 W. Eldorado Street, Decatur, IL 62525. An Equal Opportuni-

Nueller Co.

#### DATA PROCESSING **PROFESSIONALS**

Keane, Inc. is one of the nation's largest, most experienced data processing consulting companies Exciting permanent openings exist in the following areas for experienced (3+ yrs.) PROGRAMMER ANALYSTS:

BALTIMORE

**NEW JERSEY** 

UNIX "C", IDMS/ADS/O, SAS, RAMIS, CICS, IMS/ DB/DC, COBOL

#### BOSTON AND NY

Financial or Healthcare RPG II – System '36 and Wang VS

Join our 675+ professional staff Relocation assistance, excellent salaries, and comprehensive benefits.

Call Douglas Peck, at (617) 241-9200, or send resume to his attention at Keane, Inc., Ten City Square, Boston, MA 02129.

KEANE

THE ESSENTIAL PROFESSIONALS

#### CONSULTING COAST - TO - COAST

If you are a professional in any of the following skills, we have an assignment that can offer you the geo-graphic, financial and career advantages you desire.

CVAX LATTICE "C" ETHERNET CICS DL/1 VAX - UNIX IDMS/ADS-O ADABAS/NATURAL HARDWARE ENGINEERS

Knight Programming Support is an International EDP Consulting Organization servicing the industry for over 16 years. For immediate consideration call or send resume to: Lisa Cohan (212) 355-7760.

KNIGHT PROGRAMMING SUPPORT. LTD.

800 Third Avenue, New York, N.Y. 10022

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

# STOP WAITING FOR A CHANGE! MAKE ONE!

Cap Gemini America is an international data processing software consulting company with a US network of 27 branches and over 1500 consultants. Due to unprecedented growth we have immediate openings in Denver, Chicago, St. Louis and Omaha for data processing professionals with a minimum of 2 years experience in any of the following:

IMS DB/DC CICS

**HP-3000** SYSTEM 38 UNIX. C LIFECOM HOGAN

We offer extremely competitive salaries plus paid overtime, extensive inhouse training and a benefits package that includes major medical, life insurance, dental, vision and a tax deferred savings plan.

Take responsibility for advancing your career! Call collect or send your resume to John Perrotta at our Midwest Regional Office.

312-296-9667

Subcontractors Welcome



1011 E. Touhy Avenue Suite #485 Des Plaines, IL 60018

Equal Opportunity Employer M/F

#### SOFTWARE SPECIALISTS

# The solution is in the mountains

Make your career move the right one by taking a close look at Digital and the exceptional opportunities in the Customer Support Center in Colorado Springs.

Our accelerated growth in providing state-of-the-art software support, has cre-ated key avenues for highly motivated, technically proficient specialists who thrive on working in a customer support environment.

We're looking for professionals who have superb communications skills to consult with our customers on a one-to-one basis and who possess the ability to work as an active team member while researching and structuring innovation solutions to complete software problems.

Ideal candidates should have BSCS or equivalent and/or 2-5 years experience in the VAX/VMS using DCL,

Systems Services, MACRO. RMS, System Performance Installations, Device Drivers and Layered Products preferred. Experience pro-viding Customer Support is a definite plus. Exposure to other Digital operating systems also is a plus

If you're looking for a stimulating growth envi-ronment, creative energy - and a view - send your resume with salary history to Eva Martinez, Employment Supervisor, Dept. 0602 3804, Digital Equipment Corporation, 305 Rockrimmon Blvd. South. Colorado Springs, CO 80919. We are an affirmative action employer.

People and Technology PERFECT INTERACTION



#### DIRECTOR OF ACADEMIC COMPUTING

Bryn Mawr College seeks applications for the position of Director of Academic Computing to supervise services in a networked environ-ment of mainframe, mini-, and micro-computine ers. Experience in academic computing is re-quired. Salary will be commensurate with qualifications and experience.

This is an exceptional opportunity for a creative person to provide leadership and diffection for computing in a Liberal Arts environment. Bryn Mawr College has a tradition of academic excellence and scholarly research in the arts and sciences and is committed to providing an outstanding computing envirsiment. Send letters of application, resumes and three letters of recommendation to: Dr. Judith Shapro, Academic Deputy, Bryn Mawr College, Bryn Mawr, PA 19010. For further information: (215) 645-5370. Application deadline:

#### DATA COMMUNICATIONS MANAGER

PRESENT Equipment, Inc. an Affiliate of the Linversity of Menoscia, provides leading-sides supercomputing services to a national community of academic, government and in-clusional users. The position requires a highly community of academic government and including the position of a nationwise death for dey-to-day operation of a nationwise death communication network, including equip-ment installation, monitoring, troubleshooting ord reconfiguration. The position will also in-rolive seek with communication version and perfor-mance.

Requires 4 years experience in managing data communications, including experience with UMAY: and with Ethernet\*, TCP/IP or equiva-lent technologies. Requires a strong commit-ment to transforming recently developed tech-nologies into production-level services.

Director of Administration RESEARCH EQUIPMENT, INC.

2520 Broadway Drive lerdale (St. Paul), MN 55113 REI is an equal opportunity employer JNIX is a registered trademark of AT & T "Ethernet is a registered trademark of Xerox Corp.

# SUPERVISOR-

#### Management Information Services

#### **IBM System 38**

Cytemp Specialty Steel, a leader in the specialty steel industry, has an immediate vacancy for Supervisor of Management Information Services at its division head-quarters, in Titusville, PA. This highly visible position will give the successful candidate the opportunity to play a key role in the early stages of a challenging project, in-volving state-of-the-art business information systems for the entire division. The major responsibilities and duties will include supervising and assisting in the development, design, test, code and implementation of pro-grams/ systems.

The interested candidate should have a Bachelor de-gree in Computer Science, Business Management or related field. Minimum of 5 years programming experi-ence, 3 of which include experience with an IBM System 38 and RPG III programming is required.

The position offers excellent benefits and a competitive salary commensurate with educational background and experience.

For immediate consideration submit resume with s history and requirements in strict confidence to: Robert D. Newcombe, Industrial Relations Department.



CYTEMP SPECIALTY STEEL P.O. Box 247 Titusville, PA 16354

An Equal Opportunity Employer M/F/H/V

# Urgent Contracts

TRIDENT urgently requires analyst/programmers for long-term contracts, all locations with any of the fol-

- IBM IDMS/ADSO
- IBM ADF
- UNIVAC MAPPER
- ACP/IPARS
- IBM COBOL CICS DL1
- IBM COBOL IMS DB/DC
- · ACP/PARS

Additionally, if you are looking for a contract please call now and register your details.

Call Tony, Scott, Barry or Davis Now. (617) 460 0287



Manager, Computer Syste

Manager, Computer Systems. Develop computer interfaces for scientific test equipment. Develop programing in Forth language for software for test equipment, implement programs, and train staff in areas of programming and computer interfaces. Minimum 2 to 4 yrs college in Electrical Engineering and 7 to 10 yrs experience computer hardware/software development. Strong background in hardware/software development. Strong background programment. Applicants send ad with resume to PO Box 9560. Sacramento, CA 95823-0560 by June 12 and refer to Job # CR3131.

Development Team of nati products company. Position in supervision and follow-up of sign review.

Advertising in Computerworld's recruitment pages will expand your pool of computer-professionals by 687,000

> To place your ads Call toll-free 800-343-6474 In Massachusetts (617) 879-0700

KANSAS

CITY

CICS MANAGER

Take charge of 5 person technical support group specializing in CICS. Ability

to supervise technical per-sonnel required. Prior CICS exp preferred. Be responsi-

ble for interface between

applications groups & technical support for maximiza-tion of CICS. To \$40's

MEG ANALYST

Newly converted MVS shop seeks take charge manu-

seeks take charge manufacturing analyst. Ability to take charge of work in process & material requirements planning systems necessary. Excellent opportunity to move into mangement.

To \$38,000

ROBERT HALF

of Kansas City 127 W. 10th Street

(816) 474-4583

MINNEAPOLIS

ST. PAUL

PROJECT LEADER

Well-established Twin Cities financial services firm has unique growth opportunity for Project Leader to lead design/development of new systems on IBM maintrame.

Requires functional and coding experience in CICS

coding experience in CICS and/or IMS. To High \$30's

INSTALLER/8100

Fast-growth retail/wholesale firm in Twin Cities seeks per-son to do installation work with 8100's for distributed

processing. Requires CO-BOL, 8100, and DPPX experience. To \$40,000

Merk David or Tim Sraith ROBERT HALF

3636 IDS Cente neapolis, MN 55402 (612) 339-9001





# ROBERT HA

#### EDP OPPORTUNITIES COAST TO COAST

Robert Half, staffed by EDP professionals for EDP professionals with 80 offices throughout the U.S., Canada & Great Britain, is the largest network of personnel consultants in the Data Processing field. And its establishment in 1948 also makes Robert Half the oldest. One call and you can search the local, national and international markets ..... ALL FEES ARE PAID BY CLIENT COMPANIES, OF COURSE. The following is a partial listing of opportunities and locations.

#### HARTFORD

#### PROJECT MANAGERS

Conn client seeks aggressive, technically competent individuals to manage a project including voice/data integration, DASD mgmt, and stallations of on-line sys tems. Senior level positions offering growth, visibility and financial rewards. To \$55,000+

#### DIRECTOR PLANNING

Manage the development of a long-range strategic plan for future application develop-ment bkgrd in corp finance & investment + a strong bkgrd in systems devel. Will work at a sr level & manage a staff of sr designers/plan ners. Excellent growth po-tential. To \$60,000

#### DIRECTOR SYSTEMS DEVELOPMENT

Direct all development efforts in fin'l systems. Emphasis on portfolio mgmt, fin'l & invest-ment sys. Will be respon for all planning, development and implementation. Requires nt mgmt & inte To \$60,000

#### TECH PLANNING

Conn fin'l client seeks indiv to provide an IBM/MVS ennt long term growth oppty to move into mgmt. To \$43,000

#### SENIOR CONSULTANT Conn multi-div corp has im-mediate oppty for indiv to provide all human resources (pers, payroll, benefits, etc.) to local/remote user div's. to local/remedia. Occasional travel regio. To \$47,000

#### D/BASE (IMS)

Do you want to pursue a tech career in data base rech career in data base, modeling or performance? If you have min 2 yrs of DP exp w/strong tech skills, you may be qualified. State-of-the-art IMS shop will provide IMS DB/DC training.

\$30–45,000

# ROBERT HALF of Hartford 111 Pearl Street Hartford, CT 06103 (203) 278-7170

#### WASHINGTON

#### BIG IBM

Majer Maryland company is expanding! COBOL, CICS, IMS are pluses! Programmer Analyst position. \$40,000

ROBERT HALF of Washington 7316 Wisconsin Avenue Suite 401 Washington, DC 20814 (301) 652-1960

#### BOSTON

#### VM SYS PROGRAMMER

Recognized svcs co seeks tech skilled VM specialist w/ hvy comm/networking em-phasis. IBM 3083 VM/CICS, DOS/VSE, VSAM, VTAM, NCP, Datacom DB, DYNAM-D/T technology, Small but evtechnology. Small but ex-panding sys dept offering tech challenge & upward mobility. To \$50,000

#### PRODUCT SUPPORT

Leading s/w devel firm seeks astute sr P/A for client sup-port. Previous BAL & COBOL in OS or DOS environs a must. Use your tech & comm skills w/this fast growing co. Salary to \$38,000

#### SYS-38 P/A

Tech challenge, outstanding work environ & convenient S of Boston loc! Our client seeks an accomplished RPG III specialist to lead small team on diverse business apps projs. Prior devel red'd as is proj mgr potentia

#### ROBERT HALF of Boston 100 Summer Street Boston, MA 02110 (817) 423-1200

#### BUFFALO

#### MVS SYSTEMS PROGRAMMER

F500 mfr located in rural NY/PA setting seeks MVS Systems Programmer w/min 2 yrs exp. Should possess ship potential as co promotes from within. Much better than average caree oppty for bright, creative person. To \$43,000

# ROBERT HALF of Buffalo 420 Main Street 1310 Liberty Buildin Buffalo, NY 14202 (716) 842-0801

#### PROVIDENCE

#### BUSINESS SYSTEMS ANALYST

Dynamic mfg firm seeks well-versed S/A for redesign of integrated mig/fin'l systems.

Req's inventory, MRP, sales & acctg apps devel exp.

Exposure to IBM, OS/MVS, IDMS & previous COBOL Exposure to military in the individual in

# ROBERT HALF of Providence 900 Turks Head Buildin Providence, RI 02903 (401) 274-8700

#### ST. LOUIS

#### DP MANAGER CENTRAL ILLINOIS

Bring your knowledge of Hewlett-Packard systems to this service organization in rural Illinois. Must have strong COBOL applications background and be able to manage a staff of 8. Will deal with packaged software & use your verbal communi-cation/presentation skills much of the time. Salary to \$40,000

#### COBOL PROG/ANALYSTS Several positions exist in the Midwest for Programmers with at least 2 yrs COBOL experience on IBM/MVS or Honeywell systems. CICS or DPS-8 would be a big plus. These companies offer learly These companies offer lead-ing-edge technology, high visibility and broad responsiand broad re bility in service, busine financial, and mfg appl

tions. Salaries range to \$35,000

# CICS SYS PROG

CICS. This MVS installati has a firm commitment to nas a firm commitment to data processing and is cur-rently running CICS release 1.6.1 with plans to install 1.7 and expand their CPU power with a 3090 proces-sor later this year. Salary to \$37,000

# ROBERT HALF of St. Louis 7733 Foreyth Blvd. St. Louis, MO 63105 (314) 727-1535

#### AUSTIN PROGRAMMER

Degree preferred. Super fringes! 3+ years on IBM 30XX, OS/MVS. COBOL-IMS DB/DC required. Insurance applications, would p "Universal Life" packs ns, would prefe nce with policy pro-

SYSTEMS PROGRAMMER Large IBM 3080 shop. Must be very hands on SAS, JES, OS/MVS-XA, IMS. Extensive oves quickly for right erson. Excellent upward obility. \$42,000

#### ROBERT HALF of Austin 400 East Anderson Suits 334 n, TX 78752

#### SEATTLE

#### DATA ANALYST PROJECT LEAD

Seeking individual with 2-3 yrs logical data analysis & data modeling experience; relational theory, entity-relationship modeling & sematic data modeling know-

#### IDMS DRA

Seeking individual with 2+ years experience developing physical & logical data base design in IDMS environment. To \$40,000

#### IDMS S/A

Seeking individual with strong analytical skills and IDMS/ COBOL experience for major project development effort. To \$37,000

#### Marjie Peterson ROBERT HALF of Washington State 600 University St., #2328 Seattle, WA 98101 (206) 524-9000

#### WESTERN MICHIGAN

#### **RPG III ANALYSTS** Several positions available, western and northern Michigan. Can accommodate experience. From \$22-32,000

#### MVS SPECIALIST

Take over as resident expert in shop converting to IBM. Company will train in related ch as JES-2, CICS, VTAM, ACF.

#### To \$40,000

ROBERT HALF of Western Michigan 751-B Kenmoor SE and Rapids, MI 49506 (616) 956-9525

#### WISCONSIN

#### SR PROG/ANALYST

Time to seize the chance! 3+ years COBOL with a backnd in fina Knowledge of Unive \$25-33,000

#### TELECOMMUNICATIONS ANALYST

A real challenge! South-eastern Wisconsin company setern Wisconsin company seking a "guru" in SNA and olce & data communica-ons. Leadership ability a lus. \$40,000

## k LaPoint or Dick Bird ROBERT HALF of Wisconsin 777 E. Wisconsin Ave. Milwaukee, WI 53202 (414)271-HALF(271-4253)

#### SAN ANTONIO PROGRAMMER

#### ANALYST

re solid exp v and COBOL. Helpful if good Data Base, IDSII. Company will move quickly for the right skills. To \$35,000

#### SR PROGRAMMER PROJECT LEADER

Must have solid HP3000-skills. Will involve heavy pro-gramming with proven serv-ice bureau. Will be Sr DP person. Good opportunity. To \$42,000

#### SR PROGRAMMER DP MANAGER

Must have 1½ years RPGIII exp with inventory appl. Ideal for Sr Prog to move into mgmt. Excellent visibility-reports to president. To \$40,000

#### EDD PLANNING ANALYST Need an ARTIFICIAL INTEL-LEGIENCE specialist to work in R&D dept. Must be a creative type with broad technical background. Chal-lenging environment.

#### \$45,000 ROBERT HALF

of San Antonio 6243 IH 10 West, Ste.850 San Antonio, TX 78201 1-800-531-5402 In TX dial (512) 736-2467

#### TENNESSEE

#### PROGRAMMER ANALYSTS

Many Tennessee companies are expanding their DP staffs due to rapid increase in bus Willing to relocate sharp candidates with 2+ years COBOL and IBM OS JCL. Pluses include fourth generation languages, CICS or any data base experience. or any data base experience.
Industry background in banking, insurance or manufacuring preferred.

To Mid \$30's

ROBERT HALF of Tennessee 1101 Kermit Dr., Ste. 407 Nashville, TN 37217 (615) 361–4900

#### **NEW MEXICO** SYSTEMS DEVELOPMENT

Excellent career position with expanding IBM large-scale shop. Supervise large professional staff in development and implementation of banking applications. OS/ OS/ banking applications. OS/ MVS, COBOL, CICS. Start \$45,000

Dick Starnes ROBERT HALF of New Mexico P.O. Box 3320 querque, NM 87190 (505) 884-4557

#### SOUTHERN CALIFORNIA

#### SYSTEMS PROGRAMMERS

Int'l client w/multi openings seeks knowledge of MVS, VM, IMS, CICS or DOS sys soft-ware. Exp in software test-ing & IBM assembly. Salaries \$40-80,000

ROBERT HALF of L.A. 3600 Wilshire, #2000 Los Angeles, CA 90010 (213) 386-6805

#### OKLAHOMA

#### SERVICE ENGINEERS

Outstanding service com-pany needs several engi-neers for positions based in Oklahoma, Texas, and Lou-islans. Must have 2 – 3 years experience servicing 30XX or 40XX series mainframes.

#### ROBERT HALF of Oklahoma City 1601 N. W. Expressway Suite #777 Oklahoma City oma City, OK 73118 (405) 843-0800

#### PROGRAMMER

(Work Location: Las Vegas, Nevada,

These positions require a Bachelor's Degree in Business Administration, Mathematics, Engineering, Computer Science, or related fields. Must have two or more years of applicable systems analysis and programming experience, to include COBOL and POWERHOUSE programming on HP 3000 Computer using IMAGE database. Should be able to communicate effectively with business and engineering people and have a solid foundation in structured methods of design and programming.

#### SYSTEMS ANALYST/ PROGRAMMER

(Work Location: Mercury and Tonopah, Nevada) These positions require a Bachelor's Degree in Business Administration. Mathematics, Engineering, Computer Science, or related fields. Must have two or more years of applicable systems analysis and programming experience, to include COBOL and/or FORTRAN programming on timesharing systems. IBM or DEC experi -ence preferred. Should be able to communicate effectively with business and engineering people and have a solid foundation in structured methods of design and programming.

EQUAL OPPORTUNITY EMPLOYER - M/F confidential Liberal Fr Must be a U.S. citizen

Send Resumes to:

Trudie L. Rainey

**Employment Section Chief** Reynolds Electrical & Engineering Co., Inc.

Post Office Box 14400 Las Vegas, NV 89114

Telephone: (702) 295-1900



# CAE/UNIX SYSTEMS DEVELOPMENT ENGINEERS

We are hiring innovative, goal-oriented engineers who are nterested in expanding their technical horizons in Computer Aided Engineering design and systems support using UNIX and C. Experience in CAE or CAD for electronics, engineering database management, distributed processing/networking, interactive graphics and UNIX systems support is a plus for these positions. Positions are available at a variety of levels for individuals with at least a BSEE or BSCS.

For immediate consideration, send your resume to Professional Staffing, Dept. 653EV21, Lockheed Missiles & Space Company, P.O. Box 3504, Sunnyvale, CA 94088-3504. We are an equal opportunity, affirmative action employer. U.S. citizenship

Lockheed Missiles & Space Company



#### ADABAS/NATURAL

We're CTG, the number one provider of quality software development services to Fortune 500 clientele.

We currently have positions for PROGRAMMERS and ANALYSTS with a minimum of one year ADABAS, NATURAL or COM-PLETE experi-ence. If your area of expertise is in the Development of Commercial Applications, we would like to talk with you about opportunities in Manufacturing, Financial or Corporate Systems Development.

We have positions available in several Southeast cities, including: • WINSTON-SALEM, N.C. • CHARLOTTE, N.C. • GREENVILLE, S.C.

In order to attract and retain superior individuals, CTG provides an ex-cellent salary and benefits package as well as challenging assignments and a unique opportunity for professional growth. For additional infor-mation, CALL or RUSH your resume to:

COMPUTER TASK GROUP • 3410 Healy Dr. Winston-Salem, N.C., 27103 • (919) 765-1753 Equal Opportunity Employer

#### SOUTHERN

call for an interview and mail resum		мень
P/A Gas Accounting Sys.	LA	
P/A Loans OS/MVS	TX	
P/A General Ledger DOS/VSE	TX	
P/A FLA Software Bank	AL	33K
Sys OS/MVS Internals 2 vr.	MS	Open
P/A Stratos ATM Interface	FL	35K
Sys Tandem Guardian	AZ	45K
Sys VTAM ACF/NCP Internals	AZ	40K
Sys OS/MVS Internals	TX	45K
Mgr Gas Acct Systems	LA	4714
DBA IDMS CA, GA, TX, NM	AZ	488
Ani Comm. MAP, LAN, Broadband	-	45N
P/A Burroughs Bank B4900	TX	354
P/A Burroughs Financial	GA	
P/A Burroughs Banking	IL	30V
P/A Insurance Sys Dev	TX	
P/A Life 70 OS/MVS CA, GA	TX	
P/A Insurance (Assembler)	TX	35
Dia Life To	100	331

EXECUTIVE CONSULTANTS
3331 Yourse Drive, Sts. 100
Shraveport, LA 71105
(316) 222-1000

#### FAIRFIELD UNIVERSITY

Assistant/Associate Professo of Computer Science

infield University is a Jesus toxolo localite ear Long Island Sound, about 70 miles from lew York and 30 miles from New Haven. This a tenure-track position requiring an average mark and salery are competitive and will de and on qualifications. Preferred qualifications clude a Ph. D. in Computer Science or in a re-cided a Ph. D. in Computer Science or in a re-sistant salery and the computer of the position is filled. Starting date is September 1986. A port Mathematica/Computer Science solition is filled. Starting date is September 1986. A port Mathematica/Computer Science position in proceeding of an interested, suitably articulum vitae and three fetters of recom-endation to.

George E. Lang, Che & Computer Science Fairfield University Fairfield, CT 06430

#### VICE PRESIDENT and GENERAL MANAGER EQUIPMENT REMARKETING FLORIDA LOCATION

prtune Lessing, Inc. a subsidiary of Fortune defaul Savings and Loan Association of senvater. Florida has created a new posi-on for the remarketing of its computer equip-ent profition and to manage the buy/self ac-rities for the company. Fortune Lessing ignates lesse transactions for its own port-io, and engages in user purchase and sale.

#### **FREE RESUME** SERVICE

Even though we are a recruiting firm, we do offer a free resume service. Write or call for a resume preparation form. Complete the orm and mail to us and we will re turn a completed resume to you. This is a confidential service with

> Call (919) 378-1261 Adkins & Associates Ltd. P.O. Box 16062 Greensboro, NC 27416

#### COMPUTER **PROFESSIONALS**

#### We've made our move... Now it's your turn!

M.I.S. International and our subsidiary, Autoflex, Inc. have moved our corporate headquarters from Southfield to our new 18,000 square foot facility in Farmington Hills, Michigan.

We're one of Michigan's largest consulting firms; for 16 years, our data processing and engineering professionals have provided services to Fortune 500 firms including major auto-mobile manufacturers and suppliers.

We are enjoying exceptional growth, making this a perfect time for you to move up with one of our subsidiaries or divisions: M.I.S. International (data processing), Micro Computers (hardware/software design and development), Autoflex Inc. (robot systems development) and Engineering Services (automotive engineers and technicians).

Permanent positions on our technical staff are available for professionals with 1 years' experience in:

- MRP Senior Analyst, Mfg. Bkgd.
   FOCUS IBM Mainframe
   IMS DB/DC with COBOL.
   DL/1 or CICS a plus
   Purchasing-Packages

We offer state-of-the-art working environments, competitive salaries, comprehensive health care coverage, tuition reimbursement, liberal profit sharing, referral bonus, overtime and relocation assistance. For more information, contact Marie Clark or Steve Barber at 1-800-521-2144 or send resume to: M.I.S. international, 23380 Commerce Dr., Farmington Hills, 8il 48024.



Farmington Hills . Atlanta . Ft. Lauderdale

#### **CURIOUS** ABOUT CLASSIFIED?

If you are interested in advertising with Computerworld, but don't know how to do it, give us a call! We will be glad to send you our current rate card, which explains sizes, costs, deadlines and requirements. All you have to do is ask! Our toll free number is 800-343-6474, in Massachusetts call (617)879-0700, just ask for the Classified Advertising Department. Or, you can look for our classified order form located in the classified section of Computerworld. Fill it out, attach your ad with a check, and return it to us. Computerworld Classified Advertising, 375 Cochituate Rd., Box 9171, Framingham, MA 01701-9171. We're anxious to help!

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

#### \* TAX FREE INCOME \*

EUROPE \* ROREA \* 5. PACIFIC \* EGYPT \* TURKEY
We have more jobs available
than any other Agency in the country.

OVER 13.000 OPERINGS ANIABLE IMMEDIATELY!
FREE TRAVEL FREE HOUSING
FREE FOOD FREE MEDICAL
OUR Clients are bised.

Our Clients are hiring NOW for all major systems, micro and mini computer: PROGRAMMERS ANALYSTS SOFTWARE ENGRS. TECHNICAMS D.P. MGRS MACH. ENGRS.

TECHNICIANS D.P. MGRS MACH. ENGRS.

MANY, MANY OTHERS
OPEN SUNDAY 9-3 PST

Weekdays 8:30-5:30 p.m.

Call or send resume to:

Verseas
Unlimited Agency, Inc.
CALL NOW

(213) 739-8080 D Wilshire Bl., Ste. 908CW, Los Angeles, CA 900

OR CONTACT (208) 344-0442

290 Bobwhite Ct., Ste. 240CW, Boise, ID 83706 FOR the following states only: ID, MT, ND, OR, SD, WA, WY.

(813) 985-7300

7402 N. 56th St., Ste. 800CW, Tampa, FL 33617 FOR the following states only: AL, AR, FL, GA, KY, LA, MD, MS, NC, SC, TN, VA, DC, WV.

OR CONTACT (201) 624-3700

Gateway One (at Penn Sta.), Ste 501CW, Newark, NJ 07102 FOR the following states only: CT, DE, ME, MA, NH, NJ, NY, PA, RI, VT.

Advance Fee of \$430.00 refundable if we fall to match you with a minimum of 3 positions within 15 working days. Employment not guaranteed. Licensed and Bonded.

#### SR. DATA TECHNICIAN

Fortune 500 Company has an immediate career opportunity for a Senior Data Technician.

Qualified candidates must have at least 5 years experience in a multi-vendor data network, 3 years of supervisory experience in maintaining an on-line network. Heavy user interface is required.

We are a rapidly expanding multi-billion dollar corporation, located in a major Sunbell city. Our salaries are competitive and our benefit package is extensive, including RELOCATION.



Send confidential resume to: Carla Hunt P.O. Box 24600-DT Nashville, TN 37202

EOE m/f/h/v

#### Sr. Network Engineering Specialist

Stanford University seeks an experienced egineer to lead stall members in implementing and maintaining campus-wide ethientel. You! analyze commercial interesting producting analyze commercial interesting producting procedures, specifyprocure network monitoring and test equipment, supervise the construction and installation of gateway/routen and monitor performance. BSE and 3 years' and monitor performance. See and 3 years' sign, development, operation and problem analysis work are required. You must also have experience with a variety of network interfaces and UASK operating system and terfaces and UASK operating system and

Send your resume and cover letter highlighting qualifications to Kathy DeMoulin, #40224-CW, Old Pavilion, Stanford University, Stanford, CA 94305. An equal opportunity

> Stanford University

Processing Professionals



In a word, **Leadership.** 

In a few words...an unprecedented approach to comprehensive systems development.

It's an evolutionary process for achieving excellence through the development of integrated systems...a commitment to enforcing the highest standards of performance. At Fireman's Fund in Marin County, we'll be transforming 125 application systems and 15,000 programs into 15 integrated systems based on 35 logical data bases...all within 4 years. We're investing \$90 million to get these strategic systems up and running.

YOU CAN MAKE IT WORK! We're building a team to execute the company's long term objectives. It's a plan that will give us a competitive edge in our industry. It's also an exciting chance to get involved in a state-of-the-art and highly visible career opportunity.

Data Processing Professionals, it's time we talked!

# Mid-Week Call-In

Tuesday & Wednesday, June 10 & 11 3 to 8 pm (PDT)

#### CALL COLLECT (415) 492-6439

No waiting - call to talk directly with one of our Technical Hiring Managers

Be involved with one or more major development projects and impact our multiple IBM 3081/3090 MVS/XA environment. Utilizing DB2, IMS DB/DC, CICS, TSO and VTAM, you'll be shaping the nucleus of our nation-wide business information processing network.

#### SYSTEMS ANALYSIS MANAGER & ANALYSTS

Working with several project teams, your technical design consultations will be key in developing an integrated systems architecture composed of mainframes, minicomputers and intelligent workstations. Candidates for the high impact technical positions must have 3-8+ years progressive on-line application development experience, preferably with insurance financial services systems. In addition to the above, the management position requires 4+ years project management experience, preferably in the development and installation of large IMS systems.

#### SR./LEAD DATA ANALYSTS

Your role in our ambitious program requires familiarity with entity/relationship data modeling and logical data design. Prior conceptual data modeling experience, in support of comprehensive application development efforts, preferred.

#### SR./LEAD DATA BASE ANALYSTS

In addition to 3+ years of application and physical data base design experience, strong coordination skills are needed to successfully support a variety of applications development projects.

#### SR./LEAD CICS SYSTEMS PROGRAMMER

Apply your current knowledge of performance analysis/tuning, software installation and problem determination/resolution to a variety of critical projects, which will challenge your required 3+ years experience with CICS system internals on large IBM mainframes.

#### SR./LEAD CAPACITY PLANNERS

You will be responsible for capacity planning, cost value analysis, configuration analysis, and design in our rapidly growing environment. 5-8 years equipment planning experience required.

#### DESIGN PROGRAMMERS

Participate with systems analysts/users in providing technical support for new systems enhancements on existing systems. Provide technical expertise to jr. staff via technical reviews, walkthroughs, consultations, etc. Knowledge of COBOL, JCL, CLISTS, TSO/ISPF, IMS DB/DC and 8+ years of experience required.

As one of the nation's leading property/liability insurers, we're committed to continued growth and success. We offer you the opportunity to make a visible impact within our EDP environment. Your rewards will be competitive salaries and benefits, now including an Employee Stock Ownership Plan, an Incentive Savings Plan, and relocation assistance.

If you miss the Mid-Week Call-In, please forward your resume (indicating position of interest) with salary history to: Fireman's Fund Insurance Company, Systems Division, Central Employment Services C-46, Job #LM31, 1600 Los Gamos Dr., San Rafael, CA 94911. An equal opportunity employer. Principals only, places.



POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

# INTRODUCING... THE "NO RESUME

# REQUIRED INSTANT INTERVIEW"

Talk Directly With A Hiring Manager From The Convenience Of Your Home.

#### CALL US (COLLECT) **TUESDAY 6/3 OR THURSDAY 6/5** FROM 5 to 8 PM (EDT)

and, if you appear qualified for the position below, we'll connect you with the appropriate technical manager for an immediate and confidential discussion.

We serve over 5000 users with data processing services. We have enjoyed an annual growth rate of over 35% during the past 5 years and we project continual growth. We invite you to grow with us.

We can offer you an excellent salary, an outstanding benefits program which includes tuition reimbursement, company paid health, dental and optical insurance for you and your family, and the opportunity to join our staff of over 1000 very talented people.

Our state-of-the-art facility is located in fast growing Central Florida, known for its unmatched climate, year-round recreational activities, top attractions and a cost of living below the national

We presently have openings for:

#### PROGRAMMER ANALYSTS

with COBOL, JCL experience in an IMS environment. Manufacturing and inventory systems experience with MRP or MFS required. Major systems design experience desirable.

If you would like a "no resume required instant interview" and can't call one of these evenings, please call during the business day and we'll make an appointment for another evening convenient to you. We will also, of course, respond to resumes.

#### **OUR NUMBER IS (305) 826-7417**

**Professional Employment** 

#### MARTIN MARIETTA DATA SYSTEMS O

P.O. Box 13385-A, MP-357, Dept. CW602 Orlando, Florida 32859-0385 nity Employer M/F/H/V

#### MARTIN MARIETTA



#### Committed to Software Excellence!

LAI is a systems software development and consulting firm that can use your talents in UNDK, MVS, C, Telephony, and Networking! We have over 100 full time salarled professionals, and have been leaders in UNDX related software development for the past 7 years. We promote the professional growth and fulfillment of our staff by providing a wide range of high quality services and products for our cilents.

Opportunities in network communications, systems and telephony software, and systems admin/testing in Chicago, Columbus, Denver, Florida, and other locations. Geographical flexibility a real plus! For further information, please contact:

Lachman Associates, Inc. Attn: Staffing-CW 645 Blackhawk Drive Westmont, IL 60559

UNIX is a trademark of AT&T

#### Why Gamble On A Career Move?

roll the dice with an unproven firm the number of the most exclusive re each firm serving Commercial Banki

Current Openings

ODA, Bankcard, On-line Toller, Checking, Home Banking, Lessing, Wirer, Ciff, ATM, Platform Automation, owner, Senior Programmers, Project Mgrs. Systems Analysts, Systems Analysts, Systems Analysts, DBA s. AVP Level.

515 453-5444 & Retainer Search D

#### PROGRAMMER SYSTEMS 36 RPG II PA \$35,000

Consulting firm specializing in the bro-kerage industry has a hot growth spot for a P/A with 2+ yrs PPG iii 8,5/34 or S/36. Client rapport skills combines with good tech¹ foundation will land you this accoming apply Fipd

ROBERT HALF

OF NEW YORK, In 522 Fifth Avenue 522 Fifth Avenue New York, NY 10036 212-221-6500

#### SOFTWARE ENGINEER

Company has an immediate opening for a software engineer who will be responsible for product development of compatier integrated product development of compatier integrated Electrical design of control panels for required spiciations. Microprocessor assembly pro-gramming of dedicated controllers and For-rian 77. C. and Plancal programming for plant projects - to design for build to European elec-trollar and electrolinic codes, (EEC - Infernational Electrotechnical Commission.) To provide all manufals, drawings, software documentals, at manufals, drawings, software documentals.

Candidates must have a B.S. in Electrical En-gineering, have fived a minimum of 2 years in Europe, and must read, write and speak Ger-man and English in the technical ervironment of Electrical Engineering and Computer Sci-

#### DEVELOPMENT ENGINEER

JULY STREET, LENGINEER

Coordinate the irroduction of Read Time Manufacturing Automation Protocol (RTMAP) risk products. Explain RTMAP and shoot technical registering in RTMAP and shoot technical registering gram which will physically demonstrate the use of this emerging standard to interconnect use of this emerging standard to interconnect use of this emerging standard to interconnect use of the second registering the standard registering the standard

the system. Requires Mester of Science Degree in Com-puter Science. Requires research/work expa-rence (gained through 9 credits graduate level remote (gained through 9 credits graduate level remote (gained through 9 credits graduate level Area Networking totem based access proti-oss, and institute of Electrical and Electronic Engineers' 802.5 802.4 totem based protio-ces and understanding of operating systems for multi-processor configurations and network modeling/performance evaluations. Satery

BROADWAY &

Where Careers in high technology take a quantum leap . . . ahead!

If you want to accelerate your drive toward success in the field of Data Processing, you should consider the opportunities available now at Broadway 8 Seymour. We are the South's fastest growing, most advanced computer consulting company, and we are achieving national recognition for the state-of-the-art systems solutions we provide to major businesses everywhere.

Currently, we have positions available for the following:

- COMMAND LEVEL CICS
- VTAM SYSTEMS PROGRAMMING
- SYSTEMS ANALYST IBM MAINFRAME
- CICS TECHNICAL TRAINER
- 4700 RM/FCL DEVELOPMENT
- 4700 RM/FCL CUSTOMER SUPPORT

If you are experienced with one or more of the above listed skills, you owe it to yourself to write or call us. Find out why we have one of the lowest employee turnover rates in the industry.

Openings are available in Charlotte and Raleigh, N.C. and St. Paul, MN

For immediate consideration, call or mail your

Human Resources Department (704) 372-4281

Broadway&Seymour,Inc.

302 S. Tryon Street, Charlotte, NC28202

An Equal Opportunity Employer M/F

#### MAINE - N.H.

We have specialized in data processing professional placement in Maine 8 N.H. for a fifth of a century. If you qualify for positions in the \$25-50,000 range, please contact us in total confidence. Our clients pay our fees and provide relocation assistance.

#### 33×ROMAC.

Att: Dept. 2 P.O. Box 7040 DTS ortland, Maine 04112 (207) 773-4749

SYSTEMS PROGRAMMER Arington County, Virginia is looking for a Systems Programmer with experience in the installation and mainte-nance of multiple DOX/SE systems running under VM on an IBM 4381, as well as experi-ionated to the country of the country of the country systems of the country of the country of the country lated packages, such as DYMAM/D, DYNAM/I, Causting, TMON, VPM and RSCS. This consultance are such as DYMAM/D, DYNAM/I CAPICAL CONTROL OF A COUNTRY of the COUNTRY operations and SPM experience are destraind to request application material or actions in the country application from re-quired. To request application material or actions in the country operation from re-quired. To request application material or actions in the country operation from re-quired. To request application material or actions in the country operation from re-quired. The country operation from re-ductions into material or actions of the country operation from re-quired. The country operation from re-ductions into the country operation from re-ductions in the country operation of the country of the country of the country operation of the country of the count

advertisements.

#### RESEARCH TRIANGLE OPPORTUNITIES

The Underwood Group, Inc.

# NEW YORK/NEW JERSEY CONTRACTS

#### INDEPENDENT CONSULTING

Hi \$\$\$/Day **FULL TIME** 

Career Advancements, Inc. 275 Route 18
East Brunswick, NJ 08816
212-888-5172
201-238-7060

#### PROGRAMMERS PROGRAMMERS/ANALYSTS IBM

We have rumerous openings with southeast-ern client companies that include manufactur-ing, insurance companies and financial instan-ion of the companies of the companies of the standard separation of the companies of the initial party of the companies of the companies of the initial party of the companies of the companies of the initial party of the companies of the companies of the initial party of the companies of the companies of the convenient for you, or send resuma 1840 Guill Life Twr., Jax. FJ. 32207. Susan Lumidord.

Jim King and Associates

**DIRECT CONTRACTS** N.Y., N.J., CONN., & L.I. PRINCETON INFORMATION LTD.

#### to \$550/day

All skills welcome including
Realtime PASCAL
UNIX C
X.25, SNA
Stru

n Plaza, NY, NY 10001 212-563-5030

#### NCC SHOW ISSUE June 16, 1986

(Classified closing June 6, 1986)

#### NCC WRAP-UP ISSUE June 23, 1986 (Classified closing June 13, 1986)

The biggest computer show of the year is being held June 16-19 in Las Vegas. But don't worry if you haven't advertised yet. Computerworld will have one more issue dedicated to the NCC. That will cover everything that happened at The National Computer Conference. This issue will inform our readers who were unable to attend NCC all about it. The happenings, speeches and all current news. Again this year we had bonus distribution of Computerworld at the show. That bonus distribu-tion meant that over 500,000 readers saw your

#### COMPUTERWORLD

**Classified Advertising** 375 Cochituate Rd, Box 9171 Framingham, MA 01701-9171

800-343-6474 (617)879-0700

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

#### **IBM S/38** Programmers/ Programmer Analysts

#### Dial 1-800-327-5352 Toll Free And You're In Touch With A Dynamic Future!

On June 3rd & 4th, between 5:00 and 8:00 p.m.,
Technical Managers from Dynamic Control will be
discussing advancement opportunities with qualified
IBM S/38 data processing professionals. If you have
prior S/38 RPG III experience or possess experience in
S/34 or S/36 RPG II, you may qualify for a challenging
position with our staff of more than 200 IBM S/38
professionals. professionals.

Dynamic Control is evolutionizing the healthcare industry with a new generation of hospital data processing systems. Our goal to increase productivity and decrease healthcare costs is your opportunity to apply your programming/analysis skills in an atmosphere of rapid growth. atmosphere of rapid growth.

We maintain an interactive, on-line environment as well as many on-site training/educational programs. Many positions are now available within Systems Development, Implementation, Modification, Pharmacy or Customer Support. Some assignments may require

Your performance will earn you a highly competitive salary and a comprehensive package of employee benefits. Find out more by calling Carol Winstead, Jeanne Bockstege, or Elaine Kirchner TOLL FREE at 1-800-327-5352, or send your resume to: Human Resources Dapt. CW/0602, S87 E. Sanlando Springs Dr., Longwood, Ft. 32750-5187. An Equal Opportunity Employer M/F.



#### THE SYSTEMS CHALLENGE ...

It has taken an ongoing commitment to technology to sup-port Humana's integrated healthcare system. The demand for the systems to efficiently control our operations is tre-mendous. We're in the forefront of healthcare today because we consistently incorporate the very latest, most versatile technology...

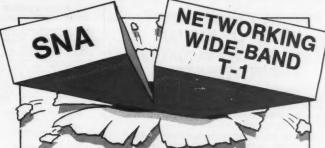
#### FOR A WORLDWIDE HEALTHCARE NETWORK

#### PROGRAMMERS · SYSTEMS ANALYSTS • PROJECT LEADERS

Our need is for individuals with experience ranging from 3 yrs. and up. Our opportunities for advancement are almost limitless, as the best in software talent move into both management and technical fields.

Our assurance is that you will find challenge and growth in a corporation committed to technology. Now is the time to find out more about your future with Humans. Please send your resume with salary history to: Eugene Ford, Jr., Humans Inc., The Humans Building, 500 West Main, Louisville, NY 40201-1438 or call COLLECT 502/580-3414. EOE/M/F.

Humana



#### **Technological Breakthroughs Career Breakthroughs**

Our bold new business strategy has got us breaking through with an expanded Data Communications Product Line and a wealth of Career Opportunities.

#### DESIGN ENGINEER

Take part in the development of innovative new products. BSEE, 3 years specific experience in Digital Electronic Design. Experience in the mass produced microprocessor based systems (Zilog and Intel preferred). Proficiency in the Data Communications or PBX, multiplexers and related products.

#### SOFTWARE ENGINEER

Join a creative team of software professionals. BSEE/CS with 2 plus years specific experience in software engineering. A strong grasp of Realtime Programming, Assembler & C language, microprocessors (Z8000 preferred) and UNIX operating system, networks and data

#### SOFTWARE APPLICATIONS

Your software design expertise will be a key factor as we move to consolidate our leading position in the industry. BSCS with 5 plus years specific experience in Applications/Data Communications Software Development. A strong understanding of C Programming language in a UNIX environment utilizing such tools as relational DBMS and graphic applications. X.25 and Z80 experience is desirable.

#### PRODUCT MARKETING MANAGER

Your extensive marketing skills and our advanced new products will form a winning combination. An enxtensive technical background in Data Communications and a strong track record in product development. Specific experience with products in the following areas: IBM, BSC, SNA protocols and X.25 is desirable.

We offer a competitive salary and excellent benefits as well as the ideal environment of Simi Valley. Join a company with momentum. BREAK THROUGH WITH MICOM.

Direct your resume to:

10011519100

D. Ballagh Corporate Headquarters 4100 Los Angeles Avenue Simi Valley, CA 93062-8100

An Equal Opportunity Employer

#### BANKING \$25,000-\$40,000

Leading North Carolina bank, experiencing unprecedented growth has
immediate opportunities available
within their state-of-the-art IMS
are a "once in a career" opportunity
for banking professionals with major
systems experience to gain IMS
knowledge of for IMS pro is to continue the enhancement of their continue the enhancement of their career
growth and comprehensive
benefits in a stable, expanding company. For details, realif-carelling. For details, call Camille Hanki it at (704) 375-0600 (no resui

needed) or rush resume to: 212 S. Tryon Street, Suite 1350 Charlotte, NC 28281 POX-MOCCIS

# Visiting San Francisco?

Assisting over a reserved.

Let us know when you are arriving and we may arrange that you stay forever!
DUA PROCESSING PROFESSIONALS skilled in Main Frames, Minis or Micror Data Base or On-Line Systems, consider a move to the beautiful

Foalayt oxuloya Ine Market Plaza, Speer Tower, Soile #2014A San Francisco, CA 94105 • 1415) 777-3800

#### DB2 CONSULTANTS

**Database Leadership Makes** SDA An Exciting Place To **Build A Career** 

Software Design Associates is one of America's foremost specialists in developing new DB2 database technology. We have challenging opportunities nationwide for talented professionals.

have challenging opportunities nationwide for talented professionals. As a valued member of an SDA consulting team, you'll develop DB2 applications, interfacing with data communications networks. In servicing major clients, you'll also provide training at state-of-the-art computer installations. SDA offers a comprehensive benefits package including paid overtime, education, and relocation assistance. Find out why an SDA career is different. Write to:

Seth A. Hanover, President

# SOFTWARE DESIGN ASSOCIATES, INC.

71 Fifth Ave., New York, NY 10003

18 Offices In • Arizona • California • Connecticut • Delaware • Florida • Georgia • Illinois • New Jersey • New York • Ohio • Pennsylvania • Texas • London, UK

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

#### **KUWAIT UNIVERSITY** STATE OF KUWAIT CENTER FOR EVALUATION AND MEASUREMENT

Kuwait University invites applications for a position in the field of educational measurement. The person appointed will report to the Director of the Center for Eval-uation and Measurement and his/her responsibilities will include the following:

- Planning, developing and implementing strategies and procedures for program and project evaluation.
- Designing, developing and administering question-naires, interviewing forms, and other data gathering instruments.
- Compiling, analyzing and interpreting research and evaluation related data.
- Writing technical reports for a variety of audiences.

- Earned doctorate or master's degree in the field of educational measurement and/or evaluation.
- University teaching experience and a functional knowledge of Arabic is desirable.

- Basic starting salary and occupational allowances for a Ph.D. holder range from KD 660 to KD1210 monthly, according to University equivalent rank for faculty members. Salary for other degree holders will depend upon experience and will be equated with University employees with salary ranging from KD 320 to KD 412 monthly (1KD currently averages \$3.45)

#### Other Benefits

- Free furnished air conditioned apartment
- Air tickets for appointee, wife and three children under 20 years
- Free medical care
- Ten to twelve weeks paid summer vacation with return air tickets
- End of service gratuity
- There is no income tax in the State of Kuwait

Applicants should send their curriculum vitae with copies of academic credentials by July 24, 1986, together with sample publications, if any, and names and addresses of three referees who can attest to suitability

> Kuwait University Office Embassy of the State of Kuwait 3500 International Drive N.W. Washington, D.C. 20008

Qualified applicants will be interviewed by the Director of the Center for Evaluation and Measurement in Washington after July 25th.

#### SUPERCOMPUTER **SPECIALIST**

The University of Arizona seeks a Research Specialist with training and experience on Cyber 205 or Cray Supercomputers. Minimum qualifications are a Doctorate degree and 4 years of research experience or Master's degree and 6 years of research experience.

Interested persons should submit a resume with salary history and qualifications to: Dr. Mike Topliff, University Computer Center, University of Arizona, Tucson, AZ 85721, (602) 621-2915.

Closing date is June 16, 1986.

An equal opportunity affirmative action employer

#### CONSULTANTS to \$400/DAY \$70,000

PER ANNUM NYC/NJ/Ct

PARAMOUNT CONSULTANTS CORP 95 MADISON AVENUE ww York, New York 10016 (212) 684-6606

#### FLORIDA CONNECTION

DATA BASE IS HOT

IMS, Cobol P/A's IDMS, IMS, Cobol note - IDMS is all new disvelopmen DBA's - IMS/DL1, DATACOM ... System Prog - VTAM/NCP, MVS ... P/A's Tandem, Cobol, Pathway ... P/A's Sys 36, 38, Banking ... System Prog - Roscoe, Librarian ....

AVAILABILITY, INC. 813 872 2631 Dept. C. P.O. Box 25434 Tampa, Florida 33622

COMPUTER SYSTEMS ANALYST WA COMPUTER SYSTEMS AMALYST wantifed to enalyze complex business immunitizating requierments, and design, develop and implecularments, and design, develop and implefination of the computer of the compute

#### APPLICATION SYSTEMS & PROGRAMMING MANAGER

Progressive, state-of-the-art organization of-fers exceptional challenge to experienced pro-ressonals. Responsible for coorfination, de-velopment and implementation of on-line, velopment and implementation of on-line, challenges of the control of the con-trol of the control of the control of the sport of the control of the control of the sport of the control of the control of the sport of the control of the control of the sport of the control of the control of the sport of the control of the control of the sport of the control of the control of the sport of the control of the control of the sport of the control of the control of the sport of the control of the control of the sport of the control of the control of the sport of the control of the control of the sport of the control of the control of the sport of the control of the control of the sport of the control of the control of the control of the sport of the control of the control of the control of the sport of the control of the control of the control of the sport of the control of the control of the control of the sport of the control of the control of the control of the sport of the control of the control of the control of the sport of the control of the control of the control of the sport of the control of the control of the control of the sport of the control of the control of the control of the sport of the control of the control of the control of the sport of the control of the control of the control of the sport of the control of the control of the control of the control of the sport of the control of the control of the control of the control of the sport of the control of the control of the control of the control of the sport of the control of the control of the control of the control of the sport of the control of the con

Southwest Florida Water Management District 2379 Broad Street Brooksville, FL 33512 EOE M/F

Programmer / Analyst
(Academic Support)
(Academic Support)
The SUNY Cogn of Technolog, an upper
division and graduate technical college, seeks
a scientific, programmer/analyst. Candidate
will be the system manager and responsible
will be the system manager and responsible
porting CAD/CAM requirements for mechancall industrial, and electrical engineering technology programs.
Caulifications: Buchelor's degree, master's
Caulifications: Buchelor's degree, master's
Caulifications: Buchelor's degree, master
Caulifications: Buchelor's degree
Caulifications: Buchelor's degree
Caulifications
Caulificatio



Director of Personnel/AA SUNY College of Technology, Drawer 6011 P.O. Box 3050 Utica, NY 13504-3050

#### S/38 PROGRAMMER ANALYST

your job with career opportunities currently available in the Southeast. No commitment required. All costs paid by Inimig companies cluding interiore expenses, flees, and relocation. If you are a talerined 5:39 or 5/56 data processing porteasonal earning between career & life by calling today.

JIM LEA, IBM S/38 Specialist (919) 584-5591 days (919) 228-7606 evenings CALL:

Any type of resume, updated or not, to: PERSONNEL PLACEMENT, INC. P.O. BOX 1815 BURLINGTON, N.C. 27216-1815

21 Opportunities Now Available in N.C., GA., NY., VA., S.C., OH., D.C., FL.

#### **COULD YOU BE** COMPUTER CONSULTANT?

JCS Consulting Service is a highly successful Data Processing Consulting Company located in Dallas. We offer a broad range of program-ming and documented services to our client companies. If you feel you are among the top 10% of your peers and have a minimum of three years experience in one of the following areas: We'd like to talk to you about a career with us.

ARS or Sabre Tall

If you qualify, please respond by resume

JCS Consulting Service #100 Spring Valley Suite 400 Dallas, Texas 75244

#### **Data Processing Supervisor**

Supervise a small honeywell shop for an 85 million sales volume manufacturer located in Michigan's upper penersula. The position re-Michigan's upper penersula, The position re-more in a structured Cobol environment. You will be a working supervisor responsible for financial and manufacturing control systems, transaction processing environment. You will read to program and communicate well and the specific program and communicate well and specific program and communicate well and specific programs and communication. Some experience with microca and communication. Some experience with microca and communication and communication of the specific programs and communication. If you are ready for a new children we called the specific programs and communication of the programs of

If you are ready for a new challenge, we offer a small town friestyle in a pleasant wooded setting. Computitive satery and fringe benefits plus relocation assistance. Submit resume in confidence to CWI-B4794, Computerworld, Box 9171, Framingham, MA 01701-9171.

#### Stability comes with the territory.

Actually, it's more like triumph. While other financial services organizations are posting losses, we continue to grow, develop and show a profit.

You see we create the Data Processing services for the leader in interstate banking. We have a presence in 17 states—a territory larger than any other bank. Which is the reason we've done very well through such crises as fluctuating inter-est rates and deregulation. Our leadership means other things to DP professionals. Like prestige, career development and ement opportunity

## Manager, Technical Services

You will manage the evaluation, development, implementation and maintenance of all operating systems software and hardware. You will also provide technical consulting and training services to our customers and other organizations.

- 5-10 years experience in hardware/software evaluation, modification and configuration analysis
- 2 3-5 years management experience in capacity planning and tuning management
- 5-10 years asset management/budget experience with a thorough understanding of unit costing and price perfor-
- □ 5-10 years project management and long range technology
- 3-5 years experience and proven record of accomplishment in management of technical services group

We offer an excellent salary and benefits package with banking privileges and many extras. For immediate consideration, please send your resume and salary history to: Susan Prassas, First Interstate Services Company, P.O. Box 54360, Mail Sort G2-5, Los Angeles, CA 90054. Equal Opportunity Employer.



#### RANKING

Sr. Systems Analyst .... ..\$38K I.S. Audit Manac \$50K I.S. Audit Manager.... Sr. Supv. EDP Auditor .. EDP Audit Staff II ..... EDP Auditor Supervisor Sr. EDP Auditor .... EDP Auditor .... \$35K

Call/send resume to Dept. C97, MSI

SOFTWARE ENGINEER, MICROPROCESSOR: Define & implement of the processor o

#### **CLASSIFIED ADVERTISING** ORDER FORM

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

Sections: Please be sure to specify the section you want: Time and Services, Software for Sale, Position Announcements and Buy/Sell/Swap. (Available upon request: Software Wanted, Real Estate, and others).

Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy. Figure about 25 words to a column inch, not including headlines. Any special artwork should be enclosed with your ad also. Logos must be submitted on white bond paper for best reproduction.

Cost: Our rates are \$161.70 per column inch. (Each column is 1 13/16") Minimum size is two column inches (1 13/16" wide by 2" deep) and costs \$323.40 per insertion. Extra space is available/and billed in half-inch increments and costs \$80.85. Box numbers are \$15.00 extra per

Billing: If you're a first-time advertiser, (or if you have not established an account with us.) WE MUST HAVE YOUR PAYMENT IN ADVANCE, or a Purchase Order Number. Any extensions on this policy must be made through our Credit Department.

Ad size desired: columns wide by . inches deep Issue Date(s): Section: Company: \_ Title: Telephone: ..

Send this form to:

#### COMPUTERWORLD CLASSIFIED ADVERTISING 375 Cochituate Road, Box 9171 Framingham, MA 01701-9171

Telecopier service is available.

Call: 800-343-6474 or 617-879-0700 extension 410 or 451

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

DATA PROCESSING PROFESSIONALS

#### SCT...

#### We're Changing...And Growing... And Still Committed To Excellence!

Our future rests on the firm foundation of national leadership in rounding systems, software and computer resource management services to both institutions of higher education and government, nationwide. We're now developing very new and highly sophistiated software packages for lice a

This growth and activity has created excellent career openings both at our corporate headquarters in suburban Philadelphia and at client sites across the U.S. We seek:

#### DATA BASE ADMINISTRATORS

Requires experience with IDMS/ADSO, ADABAS and/or DM IV.

#### SYSTEMS PROGRAMMERS

Requires experience with IBM OS, DOS, or MVS. CICS desirable.

#### PROGRAMMER ANALYSTS

Minimum of 2 years of experience on mainframe. Experience with IDMS/ADSO, ADABAS, DM IV, CICS, TOTAL, MAPPER, DMS 1100 or TIP a plus.

#### SYSTEMS ANALYSTS

Requires experience with Sperry 1100, MAPPER, DMS 1100 or TIP.

#### PROJECT MANAGERS

Large scale development experience

We offer an excellent salary, commensurate with your experience, a full range of benefits and a wide choice of exciting locales to match your lifestyle. Some positions require the flexibility to

Qualified applicants should send a resume with salary history or call: Manager of Corporate Recruting, SCT, Great Valley Corp. Center, 4 Country View Road, Maiwern, PA 19355. In Pennsylvania call: (215) 647-5830. All others call: (800) 441-7247. An Equal Opportunity Employer, MIF.



#### Fourth Generation Technology Development

# **Challenge the Limits of** Today's Technology

Join Electronic Data Systems (EDS), one of the world's largest information processing services companies, in challenging the boundaries of today's technology. ning a 4+ year development project for a very large integrated system in **Dayton**, **Ohio**. Professionals selected for this exciting new project will utilize one of the largest IBM 3270 networks in the world. Specific opportunities include:

#### SYSTEM ARCHITECT/101

This individual will develop overall real-time, on-line system architecture including: development and migration/implementation strategies, hardware configurations, and selection of environmental software (TP monitor/DBMS).

Requirements include 8+ years overall DP experience, including 4+ years of experience in the technical design of large scale real-time, on-line systems utilizing data base technologies (several hundred modules and multiple data bases). A working understanding of MVS/XA TP monitors (CICS/IMS DC), VTAM/SNA, and DBMS (IMS/IDMS) is also necessary. Experience with development of project plans, development meth odologies, productivity tools, and intelligent terminals/distributed processing is desired, as well as experience leading new system development within the past 3 years.

#### PERFORMANCE SPECIALIST/102

Responsibilities include developing predictive performance models and capacity plans relative to hardware/software configurations.

To qualify, you must possess 6+ years overall DP experience, including 4+ years experience in tuning large scale MVS-based real-time, on-line systems. A strong working knowledge of IBM system performance measurement and tuning techniques is neces sary. Experience with BGS Systems products such as CRYSTAL, BEST-1/MVS and BEST-1/ SNA in an IMS DB/DC or CICS DI/1 environment is desired. VTAM/SNA network sizing/ design experience is a strong plus.

EDS offers competitive salaries and one of the best benefits packages in the industry, along with excellent opportunity for career advancement. Take the challenge. Call or send your resume (specify job title and number) to: Jack Sparlss, Electronic Data Systems Recruiting, 12200 Park Central Drive, Suite 200, Dept. 4CW1536, Dallas, Texas 75251, 1-800-922-9060. In Texas call (214)392-8658.



An Equal Opportunity Employer M/F

#### "We have it in our power to begin the world over again'

You have it in your power to change your world -- your career and your lifestyle by contacting TRW's Operations and Support Group in Southern California.

Forget the swaying palm trees, beautiful beaches and snow capped mountains. Although much of it's true, let's forget all the hype about Southern California. Let's talk about your career and opportunities at TRW.

You can be part of a team that is designing and developing the systems of the future if you're an IDMS professional with a Bachelor's degree and at least 2 years experience. Tomorrow is taking shape at a company called TRW.

- IDMS ADS/O Programmer Analysts
- IDMS Data Base Administrator
- IDMS Software System Test Planner
- IDMS Senior Systems Analysts
   IDMS C-SPEC Project Leader

TRW offers excellent salaries and benefits including medical/dental/vision care coverage, liberal stock savings program, flexible hours, and a fabulous Southern California lifestyle. Please forward your resume with salary history to: TRW O&SG, R. Chambers, E1/4029, One Space Park, Redondo Beach, CA 90278, Attn: Dept. CW.



#### PROCESSING PROFESSIONALS

DATA RESOURCE CORPORA-TION. headquartered in Atlan-ta, is seeking individuals who desire to work in various stimu-lating Data Processing environ-ments. IMS and CICS skills are of special interest, as in the abili-ty to travel or relocate.

DRC

We are seeking an exceptional individual with at least three years of progressive EDP audit experience, preferably in the transportation or other service related industry. The successful candidate will have 4-year degree in Accounting or Computer Science, proficiency with audit software, MVS-JCL and utilities and TSO. Professional certification is desirable.

With over \$1.8 billion in revenue, USAir challenges a self-starter and offers a competitive salary with an excellen-benefits package including liberal relocation and air travel privileges. For immediate consideration, send your resume and salary history, in confidence, to:



Employment Services Dept. CW P.O.Box 15866 Arlington, Virginia 22215

Equal Opportunity Employer M/F

#### **NY METROPOLITAN AREA**

#### BANKING

- Data Comp Specialists
  V.P. level opportunities
- Project Leaders
  CICS, any Database, ADABAS a plue. DEC VAX VMS BASIC,

NK WALSH ASSOCIATES 16 W. 40 St., NY, NY 10018.

#### **EMPLOYMENT SERVICE FOR** PROGRAMMERS AND ANALYSTS

National Openings With Client Companies and Through Affiliated Agencies

Scientific and commercial applications • Software development and systems programming • Telecommunications • Control systems • Computer engineering • Computer marketing and support. Call or send resume or rough notes of objectives, safary, location restrictions, education and experience (including computers, models, operating systems and languages) to either one of our locations. Our client companies pay all of our fless. We guide; you decide:

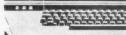
RSVP SERVICES, Dept. C Suite 700. One Cherry Hill Mall Cherry Hill, New Jersey 08002 (809) 667-4488

RSVP SERVICES, Dept. C Suite 201, Dublin Hall 1777 Walton Rd., Blue Bell, PA 19422

**RSVP SERVICES** 

# *DEVELOP*





#### Computer Professionals... Develop Your Career in Arizona with the Fastest Growing, Privately Owned Utility in the Country!

Arizona Public Service Company incorporates one of the largest and most advanced computer services departments in the state. Our corporate data system consists of large IBM 3084 and 3090 mainframes utilizing MVS/XA, JES2, TSO/ISPF, ACF/NCP, ACF/VTAM and IMS DB/DC in an SNA environment. Consider the following:

#### Systems Programmer

Requires a minimum of 3 years direct experience with IMS 1.3 DB/DC with DBRC planning and installations. System maintenance experience using SMP/E, problem determination and resolution, assembler language coding, system generation and dump analysis also required. Knowledge of RACF is beneficial.

#### **Programmer Analyst**

Requires 3+ years programming experience; COBOL and IMS DB/DC experience a must. Some experience with TSO/SPF, MFS, BTS, PL1, Mark IV, and SAS

Develop your career with APS by sending your resume to: David Bentler, ARIZONA PUBLIC SERVICE COM-PANY, Dept. CW602, P.O. Box 53999, Station 1102, Phoenix, AZ 85072-3999. Equal Opportunity Employer.



Arizona Public Service Company

Specializing In Bright Futures

#### DATA ADMINISTRATION ANALYST

\$35,916-\$44,028 & Excellent Benefits

#### San Francisco Bay Area

East Bay Municipal Utility District, the West's second largest water utility, has an immediate opening for a Data Administration Analyst. This key position will develop and maintain an organization-wide logical data model, data dictionary, and data architecture; standards, conventions and procedures for data management. The Distri operates on IBM 4341 & 4381, DEC VAX 750's and 100+ PC's.

Strong candidates will have proven skills in systems analysis; resource management; verbal and written communications; and competence in using data design tools, a data dictionary, database management, and fourth generation tools.

Submit cover letter and resume immediately to

EAST BAY MUNICIPAL UTILITY DISTRICT P.O. Box 24055 Oakland, CA 94623 (415) 891-0666



COMPUTER SYSTEMS ANALYST warried to analyze complex computer systems requirements, design, develop and implement batch and on-line computer systems requirements, design, develop and implement batch and on-line computer maintrame and assist end users with programs and procedures; Requires M.S. in Computer Science and Master's degree level courses in Structure Methods Computer Data Base Design and COBOL; \$27,500.00 per year; 40 hours per week. Send resumes to 7310 Woodward Ave. Room 415, Detroit, M. 48202. Ref. #23686. "Employer Paid Ad". COMPUTER SYSTEMS ANALYST

Programmer Analysis: 40 Implicit. Bern-fam. 5807.79(r), 300 regions like Corones in Section 24.19 (section 3.19 representation as Programmer Analysis or 1 yr experience as Programmer. Job son requires 17.2 grad courses in distal beats: 21.1 yr experience as Programmer. Job son requires 17.2 grad courses in distal beats: 21.1 yr experience as a Programmer. Job dufies are study existing asset evel-author, decroined columner filiagorietival, & development. Job dufies are study existing asset evel-author, decroined columner filiagorietival, & development. Job dufies are study existing asset evel-author, decroined columner filiagorietival, & development. Job dufies are study existing asset evel-author, decroined development. Job dufies are study existing the development of the programment of the programme

#### Sales Engineer

Call on customers to self computer equipment and systems; Evaluate of-ents needs and design a line of sales to fit their specific use; Prepare cost estimates; Provide technical services. Bachelor in Electronic Engineering with 2 yrs. exp. in the job or 2 yrs. related exp. involving installation and maintenance of computer equipment and systems. \$80,000 jry. 40 hrs/wk. Job location in Anabelia.

Interested please send resume to 2424 W. Ball Rd., Suite A&B, Anaheim, Ca. 92804 Attn: Job opening.

Prog. Analyst: Designs and devel-ops EDP Systems on IBM 3033 to replace existing manual proce-dures. Defines requirements, de-signs and codes computer procedures and programs using TSO/SPF, SAM, CICS & COBOL TSO/SPF, SAM, CICS & COBOL: Supply documentation and train-ing, provides ongoing tech. sup-ports. Req. B.S. in Computer Sci-ence + 2 yrs exp. In lieu of B.S. in Computer Science, 3 yrs. exp. Sal 832,400 pr yr. DOT 012167066. Resumes to N.Y.S. Job Service, J.O. #8001231, 435 5th Ave., N.Y., N.Y. 10017

SR. SYSTEMS ANALYST — Design & implementation of computer systems related to fin1 instit. Consult wimanaprial & programming personnel to clarify program intent. Analyze test runs & direct necessary corrections using TE-LON generated COBOL languages. Also reviews programs to increase efficiency & conserve storage space. 4 yrs app or 4 yrs el eyp. Analyst Programmer wiSupervisory exp. Must know TELON generated COBOL. TSO w/ISPF & IBM Mainframes: 3884, 3980. \$42,000/yr to work 40 fras/wk. ACSIS, inc. 90 John St. NYC (212) 732-7727

#### Finite Element

A permanent and full time position is available with an engineering consulting firm which cuses on the development of new technology course on the development of new technology control of the development of the technology control of the development of the deve

Systems Analyst - Using Intel development systems, assembles language, and PL-M to design and develop software for Intel 8031 microprocessors of digital prototype systems of programmable transculors. 35 hours/week, 9-5, \$32,775/year. M.S. in Computer Science, 1 year experience or 1 year experience as assistant systems analyst. J.O. #0600586, D.O.T. 012167066, Resumes to: NYS Job Service, 2 West Ave., Hicksville, NY 11801.

#### MARTIN MARIETTA DATA SYSTEMS

at the threshold of advanced technology . . . and beyond.

Martin Marietta Data Systems, a leader in providing com-prehensive integrated data processing systems to clients worldwide, has excellent opportunities for experienced software professionals in the following areas:

#### SOFTWARE QUALITY ASSURANCE

Management, Consultant and Engineering positions are available requiring significant software design/development experience. Current Software Quality Assurance experience that conforms with DOD and Mil. standards, Mil.—2-9958A, Mil.—5-52779A, and DOD-STD-2167 is also required. Hardware QA a plus but not required.

SOFTWARE CONFIGURATION MANAGEMENT

Managers, Consultants, and Senior Specialists with current Configuration Management experience relating to the application of the MIL-STD-480 series standard is needed. Knowledge of other relating DOD and MIL standards is a

Martin Marietta Data Systems offers excellent benefits, a stimulating professional environment, and the opportunity to advance your career as far as your initiative will allow. For immediate consideration, please send your resume includ-ing salary history/requirements to: Martin Marietta Data Systems, Dept. SB-85, 6303 lvy Lane, Greenbelt, MD 20770.

# MARTIN MARIETTA DATA SYSTEMS O

An Equal Opportunity Employer

#### DIRECTOR OF M.I.S.

Heavy experience in IBM S/38 RPG II and III, systems analysis and program-ming a must. For growth oriented cruise line in San Francisco.

Call Jim Naik (415) 956-7200

#### Systems Integration Consultant

Boston manufacture seeks internal Consultant to coordinate the integra-tion of data beservatives, principle, communications and applications de-velopment requirements for a multiple location operation. Ability to manage several division level projects, develop network policies and procedures, and serve as technical resource to MIS ex-ecutive required. Familiarity with a num-ber of environments a definite plus. Sal-ary to \$63K. Send resume and salary history to CW-B4795. Computerworld, Box \$171, Framingham, MA 01701-9171.

#### Get your money's worth. Computerworld will lower your cost-per-hire.

When you're looking to fill MIS/DP positions, there's really only one place you need to advertise. Computer-

In every major market, Computerworld reaches more data-processing professionals than the local recruitment media. And we reach them for less.

Over 600,000 computer-involved professionals receive Computerworld every week. That's more than any oth-er computer trade journal, business publication, or general-interest magazine.

Computerworld delivers quality readership, too. Fully 41% of our subscribers read Computerworld's recruitment section every week. And 95% of our subscribers read this section regularly. The openings they adver-tised for cover the whole gamut of MIS/DP positions — including systems analysts, computer science & soft-ware engineers, directors of MIS/DP, programmers, sales managers, and systems managers.

As a matter of fact, recruitment advertising has made Computerworld the national leader in classified adver-tising among specialized business publications (accord-ing to *Business Marketing* magazine).

Compare costs and the people reached. You'll find that Computerworld is the number one medium for comput-er-related recruitment advertising.

#### COMPUTERWORLD

Classified Advertising P.O. Box 9171 375 Cochituate Road Framingham, MA 01701-9171

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

# **JOIN OUR STAFF**

AND GET INVOLVED WITH CHALLENGES IN:

- · ADMINISTRATIVE SYSTEMS FOR A STAR WARS" RESEARCH LAB
- FACTORY FLOOR AUTOMATION CAD CAM
- TELECOMMUNICATIONS/NETWORKING
  JUST-IN-TIME MANUFACTURING SYSTEMS
  SYSTEM INSTALLATIONS AND CONVERSIONS
- INTERACTIVE PATIENT CARE SYSTEMS
- ON-LINE RESERVATION SYSTEMS
   BUSINESS APPLICATIONS DEVELOPMENT
   PROTOTYPING AND 4GL DEVELOPMENT
   SIMULATION/MODELING

We are also seeking experienced Branch Managers, Recruiters, and Marketing Representatives with data processing backgrounds. Excellent salaries, company paid benefits, profit sharing. Offices in Arizona, Michigan, North Carolina, and New Mexico. Relocation assistance. Send resume to:



5110 N. 44th Street Phoenix, AZ 85018 (602) 952-2336

30200 Telegraph Road Birmingham, MI 48010 (313) 644-3303

#### COMPUTER SECURITY SPECIALIST

The Jet Propulsion Laboratory, Pasadena, California, is seeking a Computer Specialist to develop Secure Software Systems. Must have detailed understanding of the require-ments, possible architectures and accreditation needs of computer systems simultaneously handling military intelligence data at several different security levels.

Requires a BS degree and minimum of six years experience in the development of Secure Systems. Must also have recent experience in accreditation of a Secure System, and significant hands-on software development experience.

Please contact J.P. McClure at (818) 354-4436, or submit a resume to: Jat Propulsion Laboratory, California institute of Technology, Professional Staffling, Department 773, 4900 Oak Grove Drive, Pasadena, CA 91109. An Equal Opportunity Employer M/F.

#### Coordinator Of Academic **Computing Services**

computing services the control of th

#### PROGRAMMERS/ **ANALYSTS**

tan Mortgage is a rapidly growing fi-stitution. We need a number of P/A's ed in CICS Command Level COBOL ultiple financial projects. We are cur-ig personnel with the following skills:

PERATING SYSTEMS: OS/VS1, VM, CMS, CICS

PLICATIONS: Contracts, Bonds, Insur-ance, Mortgage loans, Real Estate

Metropolitan Mortgage & Securities Co., Inc. Nest 929 Sprague Avenusokane, Washington 982

# **GROW WITH** HE BEST

BGS Systems is the leader in the rapidly growing field of comp management software and was recently selected by FORBES Magazine as the Third Best Small Company in the United States. Specifically, we design, develop and support software products which are used to analyze and predict the performance of IBM computer systems and communication networks, and are currently in use at over 800 installations world-wide.

To sustain our growth momentum, we seek talented, experienced professionals to develop, sell and support our products in the MVS, VM and SNA network areas. Specifically, we seek the following individual

#### Technical Professionals MVS, VM and SNA Networks

Experienced professionals with MVS, VM and SNA knowledge are needed to help lead in the development and customer technical support of our capacity planning

MVS and VM candidates should possess a technical degree and have significant experience with at least one of these systems. Knowledge of RMF, SMF or VM monitor is helpful. Experience with IMS or CICS a strong plus.

SNA network candidates should possess a technical degree, a strong data communications background and knowledge of VTAM and NCP MSNF experience is

#### Sales Professionals

Join a team of successful sales professionals in selling our established software product line, BEST/1, CAPTURE, CRYSTAL and INFOBASE. Ideal candidates will possess over three years of successful experience in computer-related sales to the large scale IBM user community. We offer outstanding support from high level technical support professionals and a telemarketing staff to qualify leads.

BGS Systems offers a professional environment, flexible work schedules and an bos Systems oners a protessional environment, inextore won schedules and an outstanding combination of fixed and flexible benefits. If you are interested in putting your talents to work in a challenging environment, please respond in writing to: Sheri Rist, BGS Systems, Inc., 128 Technology Center, Waltham, MA 02254-9111.

M/F/H/V An equal opportunity employer.



#### DIRECTOR OF UNIVERSITY OF MARYLAND COMPUTING POLICY & PLANNING

COMPUTING POLICY & PLANNING
The Director reports to the Assistant Vice President for Computing, and will have a major role in developing computing plans, policies and procedures and coordinating these with the State. Qualifications include a Master's degree or equivalent, minimum 5 years of technical management experience, and excellent writing and presentation skills. Experience in higher education is preferred. This position is located at Central Administration in Adelphi, Min ministration in Adelphi, MD

Excellent salary and benefits, commensurate with experience and qualifications. Submit applications with 3 references by 6/20/66 to Dr. R.L. Larsen, Assistant VP for Computing, University of Mayland, Central Administration, Adelphi, MD 20783.

THE UNIVERSITY OF MARYLAND



IMS DB/DC TANDEM

1-800-423-1989-2236

#### EMPLOYMENT OPPORTUNITIES IN FLORIDA

**Openings for Software Quality** Assurance Engineers:

Participate in all aspects of software quality assurance in accordance with the requirements of MIL-S-52779A and DOD-STD-2167. Requires a BSEE, BSCS, or equivalent, and 3 years related experi-

We offer salaries commensurate with abilities and experience and an excellent benefits package. Please submit resume in confidence to Employment Office, Dept. CW6/2, P.O. Box 2691, West Palm Beach, FL 33402.



#### SENIOR DRMS PROGRAMMER/ANALYSTS (SAUDI ARABIA)

In responsibilities from the development and support of highly consists to join project in responsibilities from the development and support of highly consists applications in remainment, budgeting, payments, and engineering analysis. You will enjoy the ecognition and variety of whereing in a small DP shop and at the same time become the advanced systems environment of the National Computer Center.

Your 4 + years of experience includes design, snalysis, and ADS/O programming s IDMS/DC and OS/MVS environment. Comparable experience in other DBMS environ (e.g., DATACOMMOD, ADMSAS, DB2) will also be considered. In addition to you isobnical expertise, you are an independent problem solver with well developed com-tions statis, CCS, VSMA and PLT applications experience would be a plust. Arabito from statis, CCS, VSMA and PLT applications experience would be a plust. Arabito. ion to your strong

We offer an excellent salary, relocation assistance, and allowances for housing, local trans-portation, and travel. Please send your resume to lier. All Tuwailyr, Director of Data Process-ing, The Ministry of Communications, Riyach 11178, Saudi Arabia.

THE SAUDI ARABIAN MINISTRY OF COMMUNICATIONS

POSITION ANNOUNCEMENTS

#### POSITION ANNOUNCEMENTS



NATIONAL BUREAU OF STANDARDS
INSTITUTE FOR COMPUTER SCIENCES & TECHNOLOGY
STING SYSTEM FOR COMPUTER NETWORKS PROTOCOLS"
OMPUTER SCIENTIST
NEEDED TO WORK IN MARYLAND

Sub-Contractors Welcome

- ble for the design, implementation, enhancement and extension of tems for testing computer network communications protocols.
- Designs, implements and evaluates test scenarios for testing the spectrum of services and robustness of high level computer network protocols.
- Designs, develops and implements prototype distributed systems for supporting efficient and effective resource sharing in heterogeneous computer networks.
- ant and extend test tools for ISO/FIPS computer

Nameum of three years experience designing and implementing communications protocols and test fools for communications protocols. Experience must include knowledge of ISO tools of the protocols and test fools of the protocols o

iry for GS-12 ranges from \$31,619 to \$41,105 depending upon qualifications and experi-and offer excellent career benefits and professional growth opportunities. Please send Personal Qualifications Statement (SF171) to:

U.S. Department of Commerce National Bureau of Standards ATTN: Ms. Vicki Southers (CW2921) Administration Building, Room A-123 Geithersburg, Maryland 20899

#### DP CONSULTANTS

**Project Managers** Senior P/As

Contracting or permanent positions in the following areas: VAX/VMS

- ACP/PARS
- HONEY DPS/GCOS · UNIX/C
  - · NOMAD

  - MVS SYSTEMS
- IDMS ADS/O • GCOS SYSTEMS
- NATURAL/ADABASE ● INTEL Z/80 ● HP3000 **● LIFECOMM**
- X.25/COMM

• CICS

e IMS DB/DC

● LIFE/70 **COMPDATA** 

Union, NJ 0700 201-964-5486 609-452-1555

936 Silis Deane Hwy. Weathersfield, CT 06109 203-563-8372 1016 W. Ninth Ave. King of Prussia, PA 19406 215-265-8977

1725 Jeff Davis Hwy Arlington, VA 22202 703-892-0212

• AMAPS

· MSA

• TELON

**HOGAN** 

WANG VS

**WW SYSTEMS** 

DATACOMM

. BURR/MCF

SOFTWARE DEVELOPMENT ENGINEER: Develop distailed designs and software for real time process control systems. Perform integrated system systems. Perform integrated system documents—between the state of the system develop system documents—between designs of the system documents—between designs and maintenance of the centrel system. Two to four months intermittant travel required yearly, B.S. in termittant travel required yearly state of the system of the

INDUSTRIAL SYSTEMS ANALYST INDUSTRIAL SYSTEMS ANALYST warted to analyze complex industrial and manufacturing systems: design, develop and implement Computer Added Design (CAD) and Computer Added Design (CAD) and Computer Added Manufacturing (CAD) software systems for design of various pumps and fluid transfer systems; and consult with users to ensure validity of results; Requires M.S. in Industrial Technology (Menufacturing); \$27,000.00 per year; 40 hours per week. Send resumes to 7310 Woodward Ave., Room 415, Detroit, IM 48020. Ref. #32286. "Employer Paid Ad".

#### X.25 SWITCHING DEVELOPMENT

Pinellas High Tech Company has immediate requirement for a Senior Systems Designer for the maintenance and design of X.25 packet switching software. BS/BA with at least five (5) years of X.25 protocol software development and interfacing with other vendor networks such as IBM SNA is required. Salary range is \$50,000 based upon experience. Respond with resume and salary history to

Job Order No.: 5475757 Job Service of Florida 2312 Gulf to Bay Blvd. Clearwater, Florida 33515 Attn: Pat Ganno

#### CONSULTANTS

New aggressive consulting firm in the Boston area seeks TPF and MVS experts for systems and application programming. Your own portable PC and an excellent salary if you qualify. BAL or PL/I required, CICS a plus. Send resume in confidence or call in confidence or call.

(617) 879-5009

ALEXANDER & HAYWARD 60 Dinsmore Ave. Framingham, MA 01701

ENGINEER, MICROPROCESSOR SOFTWARE: Develop new applications software for medical ultrasound imagine software for seasons in superment reaching the seasons of the seasons o languages. Salary: \$3333/mo. Job site Interview: Pleasanton, CA. Clip ad & send w/resume to Job #CR3138, P.O. Box 9560, Sacramento, CA 95823-0560 not later than June 17, 1986.

Systems Analyst - Determine hardware and 30hruan requerements, direct preparation of 30hruan requerements, direct preparation of velopment of computer systems, verify technical specifications, design and implement sys-tems including supervision and evaluation of EDP staffs and residation, rearrestenance and 50hruan staffs, and supervision and evaluation of 50hruan staffs, and supervision and evaluation of provide recommendations for upgrading and improving operating efficiency, Sachelor's de-gree in Computer Science, Mathematics or green in Computer Science, Mathematics or provide recommendations for upgrading and improving operating efficiency, Sachelor's decided work with large scale IBM Series 370 and 30XX maintrains computers, COBOL, as-embler, CCS, VSAM and CSMMS, 40 hours, SST, 50X pp armum, Reptly by resume services, CCS, VSAM and CSMMS, 40 hours, SST, 50X pp armum, Reptly by resume CF, Hurley Bidg, Boston, MA 02114, Refer to Case #6495.

Programmer

For Dictionary Project

John Hopkins University seeks Programmer

John Hopkins University seeks Programmer

an inew long-term (filteen years) computation

an inew long-term (filteen years) computation

settled project to compile a dictionary of a Similar 

mediaval filteriture. The appointment begins 

mediaval filteriture. The appointment begins 

especially in UNIX and C, and in the design of 

major distabase projects in a UNIX environ
mark. Applicants with prior knowledge of at 

least one Semilic language and an interest in 

Harannities with see at an advantage, Destats of 

salary and benefits on request. Write to: Pro
reacor Deliver R. Hilliers, Editor, the Com
prehensive ARAMAC ESTOCH, Desprehensive 

ARAMAC ESTOCH 2518.

# **EDUCATION**

#### NATIONAL UNIVERSITY OF SINGAPORE

#### RESEARCH SCHOLARSHIPS

Research Scholarships are available to outstanding university graduates registered for, or admissable to, master's and doctor's degree programmes by research at the National University of Singapore.

The Scholarships are tenable for one year in the first instance and, subject to satisfactory progress, renewable annually for another two years.

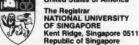
The value of each Scholarship ranges from \$\$800 to \$\$1100 per month (US\$1.00=\$\$2.18 approximately) and is not subject to income tax; the actual quantum is determined on the candidate's qualifications and experience. No travel or other allowance is provided.

Research Scholars may be asked to assist in the work of the Departments to which they are attached for not more than three hours a week. They will be remunerated for the work done.

The University will help Research Scholars find offcampus accommodation.

Application forms may be obtained from:

The Director NATIONAL UNIVERSITY OF SINGAPORE North America Office, 780 Third Avenue, Suite 2403 New York, NY 10017 United States of America



In your request for application forms, please state (a) the field of research you intend to undertake, and (b) your highest educational qualification.

Applications must be received by the Registrar, National University of Singapore by 30 August 1986.

#### Don't trust us to keep your Classified information secret

Every week, we deliver more of your target audience than anyone else. Over 600,000 computer-involved professionals. Including MIS/DP directors, systems analysts, programmers, and engineers — as well as corporate presidents, treasurers, and general managers

And we deliver these readers for less. Compare costs and the people reached. You'll see that Computerworld is the number one medium for reaching MIS/DP profes-

Our readers rely on Computerworld's classified section. In fact, 41% of our subscribers read the recruitment section every week. And 95% of our subscribers read this section regularly.

We make your ads work harder. Because we divide the classified section into logical categories: Micro Direct Shopper; Position Announcements; Buy, Sell, Swap; Software For Sale; Time & Services; and The Bulletin Board. (Others available on request.)

So the people you want to reach will spend less time looking for your ad, and more time reading it.

We'll even typeset your ad at no extra charge. All you need to do is attach clean typewritten copy to your order. (Figure about 25 words per column inch, not including headlines). Or give us your order over the phone. We'll do the rest.

And since we're published weekly, we can offer you a fast turn-around from when you place your order to when your ad appears. As little as 10 days.

The next time you want results, advertise in Computerworld classified pages. Call toll-free at (800) 343-6474. In Massachusetts, call (617) 879-0700.

COMPUTERWORLD Classified Advertising Box 9171, 375 Cochituate Road Framingham, MA 01701-9171

#### **Computerworld Sales Offices**

nt/Donald E. Fagan

2STON SALES OFFICÉ (617) 879-0700 orthern Regional Manager/Ronald Mast atrict Managers / Jim McClure, Michael I stuate Road, Box 9171,

om regjonal Director/Michael J. Masters or District Manager/Doug Cheney fct Managers/Joan Daly, Fred Lo Sapio, Frank Genovese umt Manager/Gale M. Paterno

LOS ANGELES SALES OFFICE (714) 261-1230
District Managers/Bernie Hockswender, Carolyn Knox
Western Regional Director/William J. Healey
COMPUTERWORD, 18004 Sky Park Circle, Suite 255,
Irvine, CA 92714.

R/DOHANE E. Regian
SAM FRANCISCO SALES OFFICE (415) 421-7330
Western Regional Director / William J. Healey
Sandro District Manager/Bray Million
District Manager/Sam (Million
District Manager/Sam (Chamberlain, Mark V. Gil
Account Manager/District
Classified / Nicole Boothmax
C..MPUTERWORKD, 300 Broadway, Suste 20,
Sam Francisco, CA 94133

ATLANTA SALES OFFICE (404) 394-0758 ct Menager/Jeffrey Melnick nn Regional Director/Michael J. Musters - Assistant/Melissa Christie \*\*UTERWORLD, 1400 Lake Hearn Drive, Suite 330, ta, GA 30319

DALLAS SALES OFFICE (214) 991-8366 District Manager/Merk V. Gleener Western Regional Director/William J. Healey COMPUTERWORLD, 300 Proadway, Suite 20, San Francisco, CA 94133

National Reconstruct States (6.17) 879-0.700 National Reconstructs States Manager's Dealmile Reconstructs States Manager's Dealmile Reconstructs Account Executives/Gorff Dodge Corner E. Haldford States States States (6.17) Annual States Sta

COMPUTERWORLD, 1060 Marsh Road Menio Park, CA 94025 (415) 328-8064

#### Foreign Editorial/ Sales Offices

Argentina: Ruben Argento, Computerworld Argentina, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: 34-5583/5584. Telex: 22644.

Asia: Euan Barty, Asia Computerworld Communications Ltd., 701-4 Kam Chung Bidg., 54 Jaffe Road, Wanchai, Hong Kong Phone: (05) 8L63238. Telex: 72827 (COMWR HX)

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133, Telex: AA74752 COM-WOR.

Austria: Dr. Manfred Weiss, CW Publikationen. Verlagsgesellschaft m.b.H., Josefstaedter Strasse 74, A-1080 Wein, Austria, Telex: 115 542 (sch/

Brazil: Eric Hippeau, Computerworld do Brazil, Rua Pedroso de Morais 1553, 05419 Sao Paulo, SP Brazil. Phone: 814-9658-212-8750. Telex: 11

Denmark: Preben Engell, Computerworld/ Danmark A/S, Torvegade 52, 1400 Copenhagen K, Denmark. Phone: (01) 955 695. Telex: 31566.

France: Axel LeBlois, Computerworld Communications S.A., 185 Avenue Charles De Gaulle, 92200 Neuilly Sur Seine, France. Phone: 747 1272. Telex: 613234 F.

Hungary: Dezso Futasz, SZT Computerworld, P.O. Box 386, Budapest, 1536, Hungary.

Italy: Daniele Comboni, Computer Publishing Group S.R.L., Viale Restelli 5, 20124 Milano. Phone: (2) 688 9773. Telex: 333436 (GEJIT).

Japan: Mr. Shuji Mizuguchi, Computerworld Ja-pan, 7-4 Shintomi 1-Chome, Chuo-ku, Tokyo 104. Phone: (03) 551-3882, Telex: 252-4217 (Computerworld Japan only).
Steven Yamada, Tokyo Representative Corp.,

Sanshin Kogyo Bldg., 2-10 Kando Jimbocho 3F. Chiyoda-ku, Tokyo 101, Japan. Phone: 230-4117, Telex: J26860 (reps for all CWCl publications except Computerworld Japan)

Mexico: Henry Morales, Computerworld Mexico S.A. de C.V., Oaxaca 21-2, Mexico City 7 D.F. Co-lonia Roma, 06700 Mexico. Phone: (05) 514-4218. Telex: 177 1300 (ACHAME).

The Netherlands: Wout Berends, CW Communications B.V., van Eeghenstraat 84, 1071 GK

Amsterdam, The Netherlands. Ph 6651. Telex: 18242 (CWCOM NL). therlands. Phone: (020): 64

Norway: Mr. Morton Hansen, CW Norge A/S, Hovinveien 43, P.O. Box 2862, Toyen, 0608 Oslo 6, Norway. Phone: (20) 64 77 25. Telex: 76476 9

People's Republic of China: Chen Mingkun, China Computerworld, 74 Lu Gu Gun Road, P.O. Box 750, Beijing 10039, People's Republic of China. Phone: (47) 814 6174. Telex: 222214 (CCW

Spain: Neil Kelley, Computerworld/Espana, Barquillo 21-3 izda, Madrid-4, Spain. Phone: 231 23 85: 231 23 86: 231 23 88. Telex: 47894 (CW

Sweden: CW Communications AB, Sodra Hamnvagen 22, S-115 41 Stockholm, Sweden. Phone: 46 8 67 91 80. Telex: 14904 9 (NO-VACW).

Switzerland: Gebhard Osterwalder, CW Publika-tionen AG, Witikonerstrasse no. 15, CH - 8032 Zurich, Switzerland, Phone: (01) 55 10 77. Telex:

in: Grace Tang, ACE Media Agency Ltd., Room 503, 1, Fu Hsin S. Road, Sec. 1, Taipei, 10587, Taiwan, R.O.C. Phone: 751 3636. Telex: 14142 (ACE GROUP). (Representative for all CWCl

United Kingdom: Martin Durham, CW Commu-nications Ltd., 99 Grays Inn Rd., London, WCI 8UT, United Kingdom. Phone: (01) 831-9252, Tel-ex: 262346.

Euan Rose, Bill Dunlop, Barbara Levy, Christine Taylor, Beere Hobson Assoc., 345 Goswell Rd., Is-lington, London EC1, United Kingdom. Phone: (01) 278 3415. Telex: 311951. (Representatives for CWCI publications).

Venezuela: Kalman von Vajna Nagy, CW Co-municaciones, C.R.L. Torre Maracaibo, Piso 10, Oficina H, Av. Libertador, Caracas, Venezuela. Phone: 72-76-30.

We'st Germany: Eckhard Utpadel, CW Publika-tionens GMBH, Friedrichstrasse 31, 8000 Munchen 40, West Germany. Phone: (089) 38172-0. Telex: 5215350.

W. Walter Boyd

CW Communications/Inc.

Patisks J. McGovern W. Waiter Boyd Lee Vidiner
Publisher /Vice-President, Donald E. Fagan. Senior VP-Communication Services, Jack Edmonston.
VP-Sales, Edward P. Menecki. Group VP-Chrocatetion, Margaret Phelan. VP-Phanee, William P. Murphy.
Computerworld Headquarters: 375 Cochibuste Road, P.O. Box 9171, Framingham, MA 01701-9171
Phone: (e17) 879-7070, Teles: 95-1163.
SALES Vice President, Edward P. Marccki. Manager/Marketing & Sales Operations, Kathy
Doyle, National Recruitment Sales Manager, Al Defilie. Display Advertising Manager,
Anne Hadley, Senior Coordinator, Carolyn Medieros. Display Advertising Manager,
Anne Hadley, Senior Coordinator, Carolyn Medieros. Display Advertising Manager,
COMMUNICATION SERVICES Senior Vice-President, Jack Edmonston. Director Research, Kathyn Dinneen. Sales
Promition Director, Liz Ohnson.
PRODUCTION Production Director, Liz Ohnson.
PRODUCTION Production Director, Liz Ohnson.
CIRCULATION Group Vice-President, Margaret Phelan. Circulation Director, Nary L. Merritt.
CIRCULATION Group Vice-President, Margaret Phelan. Circulation Director. Nary L. Merritt.

Monahan.

CIRCULATION Group Vice-President, Margaret Phelan. Circulation Director, Nancy L. Merritt.

Corporate Fulfillment Director, Maureen Burke.

CONFERENCE MGT. GROUP President, William R. Letch.

MIS Corporate Director MIS, Jeff Cordeiro.

Computerworld can be purchased on 35 mm microform through University Microfilm Int., Periodical Entry Dept., 300 Zeeb.

RR. An Abor. Mich. 48 10.6.

Phone: (313) 761-4700. Computerworld is indexed: write to Circulation Dept. for subscription information:

#### **Advertisers Index**

Agile 91
Astco
AT & T Information Systems64-65,75-77,96-97
Ausdata
Austec
Belden Electronic Wire & Cable
B.I. Moyle Associates
Brookvale Associates
Cambridge Systems
Canaan Computer Corp
Carterfone Communications
Chess 8
CICS Report
Cincom Systems
Codex Corp
Comdisco
Computer Associates 58
Computer Technology Group
Concurrent Computers
Cullinet 9
CW/Classified Recruitment 101
CWIMS/China 100
CW/Micro Direct Shopper
CW/Switzerland
Data Design Associates
The Data Group Corp
Datasery
Dataware Systems Lease
Decision Resources, Inc. 112-113 Digital Equipment Corp. 60,110-111
Dowling Associates
Downing Associates
Eastcom
EMC Corp
Fibronics
H & M Systems Software
Hughes Aircraft
nugnes Aircraft
IBM
IDE Associates Inc
Innovation Data Processing
N STORES AND A STORE OF THE STORES AND A STORE OF THE STO
Landmark Systems
Liberty Electronics95
A STATE OF THE STA
Martin Marietta
McCormack & Dodge
MCI Mail
michaels, ross & Cole, Ltd
This inster is permitted as an additional service. The

Micro Pro	
MicroFrame Inc	
MSA	
NBI 32	
NCR Corp. 73.118-119	
NEC	
NMTC-Boston92-93	
Okidata Corp. 109	
Oracle Corp	
PacTel Spectrum Services	
Paradyne	
Polaroid Diskette	
Quadram	
Qume	
Racal Vadic	
Realia Inc	
Relational Database Systems	
Relational Technology	
SAS Institute	
Sequent Corp	
Signal Technology	
Software House74	
Software International	
Software Merchants Unlimited	
Software Publishing	
Spectrum8	
Stern Consulting	
StarTech Software Systems	
Syncsort	
TASC	
Televideo Systems	
Topaz 42	
Tone Software	
Tower Systems International45	
TSI International	
Tymnet	
United Software	
Virtual Micro Systems	
VM Software	
Walker Interactive	
Word Perfect	
Xerox Corp	
Zilog	

This index is provided as an additional service. The publisher does not assume any liability for errors or omissic

# Pact to alter U.S. chip trade

#### Aims to increase U.S. share of Japanese mart

By Maura McEnaney
An agreement between the U.S. and Japan on semiconductor trade issues could change the way American chip companies are doing business, some observers said last week.

After almost a year of negotia-tions, the U.S. and Japan reached a preliminary agreement aimed at solving long-standing trade disputes and increasing the U.S. share of the Japanese semiconductor market.

Sources said the pact, due to be finalized in the next few weeks, will increase the U.S. share of the Japanese chip market from 10% to 20% within five years. It will also establish an export monitoring system and

dismiss pending antidumping cases.
To capture 20% of the Japanese
market, U.S. chip companies may have to change their product strate gies. In Japan, most semiconductors are used for consumer and telecommunications applications, while the majority of U.S.-made chips are designed for computer systems and defense applications.

The burden is now on U.S. companies to build a product that the Japanese companies will buy," said Jerry Crowley, president of Oki Semicon-ductor Corp., based in Sunnyvale, Calif., a unit of Oki Electric Co. in Ja-

Some vendors were puzzled over exactly how the agreement would in-

crease the U.S. share of the Japanese market. "I haven't a clue as to how that is going to get done," Crowley said.

Others in the industry were reluctant to comment on what they said was speculation about the contents of the trade agreement. "It's apparent that both governments felt this was a highly sensitive issue," Tom McDannold, vice-president of adminstration at NEC Electronics,

The news of the trade accord came two days after the International Trade Commission ruled that U.S. firms were damaged by Japanese chipmakers' dumping, or selling below cost, 64K-byte dynamic randomaccess memory (RAM) chips in the U.S. market. That ruling, the result of a suit from Micron Technology, Inc. of Boise, Idaho, slapped Japanese firms with import duties ranging from 11.87% to 35.34%.

Before last week's agreement becomes final, it must first be reviewed by the U.S. departments of State, Jus-

tice, Treasury and Commerce. William Tanaka, Wash William Washington, D.C.-based counsel for the Electronics Industry Association of Japan, called the published details of the agreement speculative and declined comment for fear of jeopardizing final negotiations.

Other antidumping suits involving 256K-byte dynamic RAMs and erasable programmable read-only memory chips are still pending, but could be dropped as a result of the trade

# Mini vendor Norsk Data good European investment



**ACTIVE ISSUES** Kathy Porteus

any U.S. computer companies are grateful for Europe's brisk business climate, which has significantly offset continued weakness in domestic orders. Individuals can also benefit from Europe's strength by investing in European computer suppliers that are traded on one of the U.S. stock exchanges.

One such company is Norsk Data (NORKZ — 26%), a \$250 million minicomputer vendor based in Oslo. Norsk's stock, which recently underwent a 2-for-1 split, doubled in value last year. Analysts following the company estimate its price-pershare may jump another 50% by

Norsk sells a fully compatible line of minicomputer systems, offering up to 3.3 million instructions per second (MIPS), for both IBM and non-IBM environments. According to Le-Ellen Spelman, vice-president with Martin Simpson & Co., about 60% of Norsk's installations are for commercial DP and 40% for scientific or technical applications.

Spelman says she expects Norsk to introduce a new high-end, 10-MIPS to 15-MIPS uniprocessor in early 1987. Norsk claims that its current high-end CPU, the ND570, provides roughly the same performance as Digital Equipment Corp.'s VAX 8600 at half the price.

In 1985, Norwegian sales accounted for 50% of Norsk's revenues and two-thirds of its profits. However, the firm is lessening its dependence on domestic business by concentrating its marketing on France (through a partnership with Matra SA), West Germany and the UK.

Porteus is president of Strand Research Associates, a Centerville. Mass.-based company that provides customized research services for financial and high-tech firms.

Robert L. Cole, analyst with Reinheimer Nordberg, Inc., says, "Matra is taking several times the amount of product from Norsk that was promised in the initial sales contract." Simpson's Spelman expects Norsk "to rank fourth in the 1986 European minicomputer market after IBM, DEC, Hewlett-Packard Co. and Wang Laboratories, Inc.

Norsk has a minor presence in the U.S., with two small sales offices selling primarily to the military.

Last year, the firm's pretax margin widened to 19.3% from 17% in 1984. "Norsk achieves such margins because it is a very well-run compa-Spelman says.

Norsk benefits from operating efficiencies by offering a product line with a single architecture and single operating system. In addition, the company is not vertically integrated, which has enabled it to take advantage of lower component prices. Finally, by not focusing on the U.S. market, Norsk avoids intense price competition.

But Norsk may not be able to avoid the current oil glut's effect on Norway's economy. Cole of Reinheimer foresees some softness in Norwegian sales, but expects Norsk's increased foreign business to significantly offset such domestic weakness. Low oil prices have improved business conditions for those European countries that are major importers of energy.

Although 40% to 50% revenue growth is not expected to continue, owing to the company's larger size, Norsk should experience several years of over 30% growth, according to analysts. Spelman estimates the company will earn \$1.75 per share in 1986 and \$2.20 per share in 1987. Cole is looking for 1986 earnings of \$1.85 per share.

Both analysts recommend purchase of Norsk stock, which currently sells at a discount to the price/earnings multiples of other minicomputer companies. Norsk is undervalued, they say, because U.S. investors tend to shy away from foreign firms, although, as in Norsk's case, such stocks present a good investment opportunity.

## Citicorp on verge of Quotron buy-out

LOS ANGELES -- Without formally agreeing to be acquired by Citicorp, Quotron Systems, Inc. paved the way for a takeover last week by telling its shareholders it would "not actively oppose" Citicorp's \$19-pershare tender offer.

Most stockholders are expected to tender their shares at that price. which would give the U.S.'s largest bank a strong presence in the financial information services market. Quotron's stock quote service is expected to benefit technologically from increased research and development funds after the proposed take-

About 40% of Quotron's stock is owned by institutions and an estimated 25% by risk arbitrageurs.

#### Lotus acquires graphics firm

sheets: Isys Corp., developer of products that allow data from public data bases to be input into spreadsheets; Infocenter Software's Ilink, a micro-to-mainframe link; and Software Arts, Inc., developer of Visicalc, Spotlight and TKsolver.

Lotus announced its intention to enhance the ability of Graphic Communications products to work with Lotus' 1-2-3 and Symphony.

However, analysts were unsure about Lotus' specific plans for the

"I think the strategic question is to what extent the graphics packages get incorporated into future releases of 1-2-3 or Symphony to improve their graphics capability," said David Readerman, a computer and soft-ware services analyst with Smith Barney, Harris Upham & Co.

Both firms expect no layoffs to re sult from the acquisition. "We don't see any change in staffing as a result of the acquisition, which is good news for everybody," said Lotus spokeswoman Janet Logan.

Graphic Communications currently employs approximately 50 people.

We have got some very strong products we can sell on Day 1, and we can add a lot of value by raising the visibility of those products through our marketing channels," Kolowich

We are also acquiring an organizational capability and some first-class development talent in the graphics area," he said.

#### CORRECTION

James J. Renier was recently named president and chief operating officer of Honeywell, Inc. [CW. May 26, page 144].

#### Sytek loses IBM contract, lays off 50

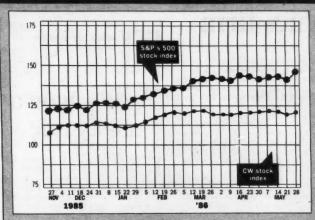
MOUNTAIN VIEW, Calif. - Sytek, Inc. recently became the latest victim of a canceled IBM OEM contract, as the local-area network vendor announced the layoff of 50 manufacturing employees, or about 10% of its work force.

IBM, continuing the pattern of cutting off product suppliers such as Computer Memories, Inc. and Seagate Technology, Inc., recently told Sytek it would not renew its contract for Sytek to supply the PC Network. L. George Klaus, the new president and chief operating officer of Sytek, said both companies had signed a oneyear extension of the contract, but that IBM "changed its mind." The contract will expire within the next two months.

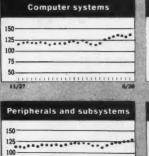
Klaus predicted that Sytek, unlike other firms that have had similar experiences, will not experience losses as a result of the lost business. "Over a year ago, we planned that this might happen," he said. "We've had less time to adjust than we would have liked, but 50% to 55% of our business has always been end-user sales. We'll continue to grow that.'

Klaus said that Sytek's revenue will experience a minimal drop in the quarter ended last week and a "more significant drop" in the quarter ending Aug. 29. Sytek recorded sales of \$20.3 million and profits of \$2 million in the quarter ended Feb. 28.

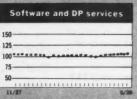
#### **Computerworld stock trading index**

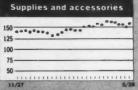


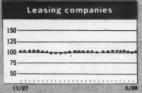
	5/21/86	5/28/86
Computer systems	127.6	130.5
Software and DP services	106.1	106.4
Peripherals and subsystems	125.9	126.4
Supplies and accessories	150.8	155.8
Semiconductors	106.2	106.4
Leasing companies	104.6	104.6
CW stock index	120.0	121.3
Standard and Poor's 500 stock Index	140.8	147.5











#### **Computerworld stock trading summary**

50 -

E C C C C C C C C C C C C C C C C C C C	52-WEEK RANGE (1)	CLOSE MAY 28 1986	WEEK NET CHNGE	WEEK PCT CHNGE
C	OMPUTER SYSTEM	MS		
O ALPHA MICROSYSTEMS O ALTOS COMPUTER SYS A AMDAHL CORP O ALTOS COMPUTER SYS A AMDAHL CORP O APOLLO COMPUTER IN A ATTOS COMPUTER IN A ATTOS O APOLLO COMPUTER IN A ATTOS O COMPUTER IN O IN O IN O IN O IN O COMPUTER IN O	9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	61 3/4 16 1/8 16 1/8 16 1/8 16 1/8 17 1/8	- 1.3/8/8 0 - 1.3/8 0 - 1.3/8	0.0 -7.8 -
N AMERICAN BUS PRODS N BARRY WRIGHT A DUPLEX PRODUCTS INC N ENNIS BUS. FORMS N 3M COMPANY N MOORE CORP LTD C STANDARD REGISTER N WALLACE COMP SERVICE	21- 36 17- 29 13- 22 14- 28 74- 107 15- 27 22- 45 30- 49	33 5/8 23 5/8 21 3/4 24 7/8 105 1/2 26 39 1/2	+ 1/4 + 1/2 + 1/2 + 1 1/8 + 7 + 2 1/8 + 3/4 + 1 5/8	+0.7 +2.1 -2.2 +4.7 +7.1 +8.9 +1.5 +3.4

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON; L=NATIONAL; M=MIDWEST; O=DVER-THE-COUNTER O-T-C-PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID (1) TO NEAREST DOLLAR

	CLOSING PRICES	WEDNESDAY,	MAY 28, 198	6	
E		,	PRICE		
CH		52-WEEK RANGE (1)	CLOSE MAY 28 1986	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTW	ARE & DP SER	VICES		
071000000000000000000000000000000000000	ADVANCED SYSTEMS INC AGREEMENT STATEMENT AND AGREEMENT ASSESSMENT ASSE	29-255-6-0112-25-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0	6 1/4 17 1/2 21 1/2 21 1/2 21 1/2 21 1/2 21 1/2 21 1/2 21 1/2 21 1/2 31 37/2 22 33 37/2 24 1/2 21 1/2 21 1/2 21 1/2 21 1/2 21 1/2 21 1/2 21 1/2 21 1/2 21 1/2 21 1/2 21 1/2 21 1/2 21 1/2 21 1/2 21 1/2 21 1/2	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	+11.1 +2.9 +3.6 +3.6 +3.6 +3.6 +3.6 +3.6 +3.6 +3.6
N	ADVANCED MICRO DEV	22- 36	26	+ 5/8	+2.4
NANOOOONNA	ADV'D SEMICONDUCTOR ANALOG DEVICES INC ANALOGIC CORP APPLED MAGNETICS CP AVANTER HADCO CORP INTEL CORP MICHO MASK INC MOTOROLA INC NAT'L SEMICONDUCTOR TERADYNE	7. 23 14. 24 11. 16 9. 19 18. 26 3. 7 21. 33 5. 12 29. 48 10. 15 17. 33	11 1/4 22 7/8 12 3/8 18 7/8 19 3/8 5 1/2 26 5 3/8 46 1/2 14 3/8 25 3/4	1/8 -1/8 +3/8 +1/8 -1/4 -1/2 -1/8 0 +1/2 -1/4	0.0 -0.5 -1.0 +6.1 -4.3 -1.8 -2.2 -0.0 +3.6 -0.9

Ε			PRICE-		
X C	52-WI	GE	CLOSE MAY 28	WEEK	WEEK
н .	(1)	)	1986	CHNGE	CHNGE
PERIPHE	RALS &	SUBSY	STEMS		
P AM INTERNATIONAL	3-	8	8 3/8	+ 1/4	+3.0
A ANDERSON JACOBSON	2-	5	2 1/4	0	0.0
O AST RESEARCH INC O AUTO-TROL TECHNOLOGY	7-	33	15 3/4	-1 1/4	-7.3
O AUTO-TROL TECHNOLOGY O AVANT GARDE COMPUTNG	3.	13		- 5/8	-12.5 +1.5
O BANCTEC INC	6-	13		+1	+8.6
O BEEHIVE INT'L	1-	2	12 1/2	0	0.0
N BOLT, BERANEK & NEW	20-	47	47	+23/4	+6.2
O CAMBEX CORP	1-	3	1 1/2	0	0.0
N CENTRONICS DATA COMP	3-	11	6 1/2	+ 1/4	+4.0
A CETEC CORP	6-	9	6 7/8	- 5/8	-8.3
A CETEC CORP A COGNITRONICS	4-	7	4 5/8	+ 1/2	+12.1
N COMPUGRAPHIC CORP	23-	36	23 3/4	+ 3/4	+3.2
O COMPUTER TRANSCEIVER	0-	.1	7/8	0	0.0
N COMPUTERVISION CORP	9-	44	17 7/8	+11/4	+7.5
N CONRAC CORP A DATAPRODUCTS CORP	12-	18	17 1/2	+ 3/4	+4.4
A DATARAM CORP	4.	17	16 7/8	+ 1/4 + 3/8	+2.2
O DATA SWITCH CORP	4.	9	7 1/4	- 1/4	-3.3
O DATUM INC	5.	9	6 3/4	0	0.0
O DECISION DATA COMPUT	10-	20	12 7/8	+ 3/8	+3.0
O ENDATA, INC	2.	8	6 1/4	+ 1/8	+2.0
O EVANS & SUTHERLAND	12-	27	26 1/8	+ 1/8	+0.4
O GANDALF TECHNOLOGIES	5-	13	6 5/8	+ 1/8	+1.9
N GEN'L DATA COMM IND N HAZELTINE CORP	8-	21	13 3/8	+ 1/2	+3.8
N HAZELTINE CORP O ICOT CORP	17-	30	17	+ 1/2	+3.0
O INFORMATION INTL INC	10-	12	12 15 1/2	+1	+6.8
O INTECOM INC	3.	11	5 5/8	+11/4	+28.5
O MEGADATA CORP	3.	8	3 1/8	+ 1/8	+4.1
A MSI DATA CORP	7.	14	13 7/8	+ 1/4	+1.8
N NASHUA CORP	24-	53	52 3/4	+33/4	+7.6
O NETWORK SYSTEMS CORP	11-	27	13 7/8	+ 1/8	+0.9
N NO AMERICAN PHILIPS	32-	47	41 3/4	+1	+2.4
N NORTHERN TELECOM LTD	26-	41	29 7/8	+ 3/4	+2.5
O OMEX	1-	3	1/4	0	0.0
N PARADYNE CORP	6-	18	11	+ 1/4	+2.3
A PENRIL CORP N PLESSEY CO (ADR)	19-	14	7 3/8 34 1/2	- 1/8	-1.6
O PRINTRONIA INC	9-	18	13 1/8	- 3/8	-2.7
O DMS INC	6-	16	13 3/4	0	0.0
O RAMTEK CORP	2.	7	5 5/8	+ 1/8	+2.2
N RECOGNITION EQUIP	9-	17	16	- 3/8	-2.2
N SANDERS ASSOCIATES .	29-	44	29 5/8	+ 1/4	+0.8
O SCAN TRON CORP	9-	22	19 3/4	+ 3/4	+3.9
N SCIENTIFIC ATLANTA	10-	15	10 3/8	0	0.0
O SEAGATE TECHNOLOGY	5-	13	12 3/4	- 1/8	-0.9
N STORAGE TECHNOLOGY O SYKES DATATRONICS	1-	5	4 1/8	- 1/8	-2.9
A TEAR INC	0- 5-	9	5 7/8	+ 1/8	-41.5
A TAB PRODUCTS CO	9.	15	5 7/8 14 1/8	+ 1/8	+2.1
O TANDON CORP	3-	9	7 1/8	-3/8	-5.0
A TEC INC	5.	13	5 3/8	-1/8	-2.2
N TEKTRONIX INC	47.	68	62 1/8	+23/8	+3.9
N TELEX	34-	68	62 1/8	-1	-1.5
O TESDATA SYSTEMS CP	0-	3	5/8	0	0.0
N TIMEPLEX INC	15-	23	18 3/8	+ 1/8	+0.6
N TITAN CORP	4-	11	10	+ 1/4	+2.5
O VISUAL TECHNOLOGY	1-	3	5/8	0	0.0
LEA	ASING CO	MPAN	ES		
N COMERSEO INC	7.	24	20 1/2	- 1/4	-1.2
N CONTINENTAL INFO SYS	5-	21	19 5/8	+ 1/4	+1.2
O FINALCO GROUP INC	3-	5	3 1/2	+ 1/8	+5.6
O PHOENIX AMERICAN INC O SELECTERM INC	2.	6	4 3/4 7 3/8	+ 1/8	+2.7
N U.S. LEASING	32-	12	7 3/8	+ 1/8 + 1 7/8	+1.7
TO U.S. CEMONIS	34.	40	41 1/6	+1 (/8	74,0

#### INSIDE

DCA eyes acquisitions to stay on top in the shifting micro-to-mainframe mart/117

IBM will be the first in Europe with an OSI-based network, an analyst predicts/122

A tentative semiconductor trade agreement with Japan may change the way U.S. chipmakers do business/148

#### INSTANT ANALYSIS

"I hope we do not have to retaliate against our trading partners. But let's face it, we've done a lot of talking with countries like Japan but are getting nowhere. Whether it be in semiconductors. telecommunications or fiber optics, they are not opening their markets to U.S. competition.

U.S. Rep. Stan N. Lundine (D-N.Y.), during debate on the House

# Lotus buys graphics firm

Hopes to tap growing market, round out line

By Douglas Barney CAMBRIDGE, Mass. -- Continuing its product acquisition strategy, Lotus Development Corp. last week announced that it had signed a letter of intent to acquire Graphic Communications, Inc., a Waltham, Mass.-based developer of the popular Freelance and Graphwriter micrographics software packages

The acquisition fills an important gap in Lotus' product line as the spreadsheet leader continues to diversify into other business software markets. Lotus expects the microcomputer graphics market to enjoy healthy growth, largely owing to reduced costs of hardware and graphics devices such as plotters and printers.

"There is a significantly large group of users of 1-2-3 and Symphony who are looking for something more in business graphics," said Michael Kolowich, corporate vice-president of marketing for Lotus. According to securities analysts, Lotus paid some \$7 to \$10 million in cash and

agreed to an earn-out formula, under which Graphic Communications principals receive a portion of the revenue from Graphic Communications products.

Graphic Communications, a 5-year-old private firm with about \$5 million in annual sales, is considered one of the top micro graphics software vendors behind market leader Decision Resources, Inc., developer of Chartmaster.

After the acquisition is approved, Graphic Communications will become part of Lotus' Business Products Division. The acquisition is expected to be completed by June 15, pending approval of the boards of both firms and Graphic Communications' shareholders

Since early 1985, Lotus has acquired GNP Development Corp., maker of HAL, an English-language interface for 1-2-3; Dataspeed, Inc., developer of products that input stock quotations into Lotus spread-

See LOTUS page 148



INDUSTRY INSIGHT

# Bandwagon a shaky ride

ast December, as the historically disappointing New England Pa-triots football team piled victory upon important victory, their hastily built bandwagon began creaking under the weight of converts, reawakened diehards and fair-weather fans. But after their embarrassing dissection at the hands of the Chicago Bears in the Super Bowl, the Patriots' bandwagon emptied quicker than a six-pack at a poker

For the players in the big leagues of the computer industry, the bandwagon effect is a familiar and unpleasant fact of life. As the industry has run into some hard times of late, one-time superstars have learned how fickle bandwag-on riders can truly be. It works both

Take Digital Equipment Corp., for example. In late 1983, DEC, once a high flier and darling of consultants and the press alike, became the object of scorn and derision.

The company was in the midst of one of the more poorly conceived personal computer strategies to come down the pike, and internal accounting problems had failed to catch and alert analysts to a poor fiscal quarter. This, combined with a lengthy reorganization, caused DEC to be painted as a stumbling giant, in no way positioned to compete with IBM or even its more suitable foes Data General Corp. and Wang Laboratories,

The DEC bandwagon, crowded to See BANDWAGONS page 120

Rifkin is a Computerworld senior

# Bell Atlantic helps Sorbus cash in

FRAZER, Pa. Eighteen months after was acquired by Bell Atlantic Corp.,

third-party maintenance firm Sorbus, Inc. today finds itself in a complete role reversal.

As part of Management Assistance, Inc., Sorbus was a cash cow and its profits were used to finance the beleaguered operations of its sister company, minicomputer maker Basic Four. In 1984, Sorbus was underfinanced and fading fast. By early 1985, as

part of arbitrageur Asher Edel-man's piecemeal divestiture of Manage-ment Assistance, Sorbus was sold to Bell Atlantic for \$185 million.

Sorbus is currently benefiting from the deep pockets and service-industry savvy of its acquisitive \$9 billion parent. Continuing to concentrate on IBM and compatible large-systems service. Sorbus is now in a position to cash in on maintenance opportunities presented by its various sister companies within Bell Atlantic

Enterprises.

'We're part of a total solution at Bell Atlantic Enterprises, and customers are comfortable buying from a 100-year-old Bell operating company," notes Louis Ross, Sorbus president.

Sorbus is picking up maintenance revenue from relationships with customers of Bell Atlantic's telephone companies, its telecommunications subsidiary Bell Atlan-

ticom and the retail Bell Atlantic Business Centers in the Compushop, Inc. chain another Bell Atlantic acquisition. We also get customer leads from Tri-

continental Leasing Corp., a Bell Atlantic See BELL page 124

# Bill said to aid U.S. high tech

#### Fights 'unfair' imports, sends message overseas

**By Mitch Betts** 

WASHINGTON, D.C. - The massive trade reform bill approved recently by the U.S. House of Represenvariety tatives contains provisions designed to help the U.S. telecommunications, semiconductor and computer industries. Some provisions attempt to fight "unfair" import practices, while others try to improve the climate for U.S. exports.

The 295-115 vote approving the Trade and International Economic Policy Reform Act of 1986 was intended to send a signal to foreign trading partners that the U.S. will not tolerate the continuing erosion of its trade balance, several legislators

The U.S. Senate, which will write its version of trade legislation this summer, is expected to approve more moderate legislation than did the House. President Ronald Reagan said last week he would veto the House version as "kamikaze legislation." He claimed the U.S. has made progress in opening foreign markets, citing an agreement for more sales of U.S. semiconductor chips in Japan (see related story on page 148).

For the telecommunications industry, the House bill would require the president to negotiate trade agreements that remove foreign barriers to exports of U.S. telecommunications products. If the negotiations fail, the president would be forced to restrict access to the U.S. market.

'Only the threat of legislatively See BILL page 124

#### Quarterly earnings: Autodesk, Novell double

Company	Net Income FebApril, 1986 (thousands of dollars)	Percent Change From 1985	Revenue FebApril, 1986 (thousands of dollars)	Percent Change From 1985
Autodesk, Inc.	2,428	+118	11,027	+118
Analog Devices, Inc.	5,979	-30	82,996	0
Datapoint Corp.	5,798		82,521	-8*
Encore Computer Corp.	(2,719)	′ -	650	+842
Floating Point Systems, inc.	3,390	+6	32,351	+7
Intelogic Trace, Inc.	5,315	+1	40,052	-1
Novell, Inc.	2,004	+151	16,070	+129
Ultimate Corp.	4,533	+48	41,213	+47

# 10 percent of your software dollar is generally responsible for 90 percent of your workload! H&M has the most you'll ever get for your 10 percent!

SoftScript Integrated Word Processing and Documentation System

SoftMail Electronic Mail and Calendaring

SoftMenu CICS Menu Driver

SoftPlan Decision Support System

SoftAccess Data Dictionary

SoftQuery Inquiry and Update

MFAST Screen Definition Management

DATAPACKER CICS Transmission Optimizer

KEYFAST Online Data Entry and Personal Computing



H&M Systems Software, Inc. 25 East Spring Valley Avenue Maywood, NJ 07607-9990 Phone: 201-845-3357 Toll-Free: 800-FOR-DEMO

# WHAT POLAROID DID FOR FILM WE DID FOR INFORMATION PROCESSING.

Needing information instantly is nothing new. But getting it is.

In fact, it's more than new. It's a technological breakthrough called EXPERT QUERY,™ the newest component of INFORMATION EXPERT.™

Expert Query has the ability to access live another. Instantly. data interactively. In realtime.

eration technology that allows all your existing or an expert at giving you all the information you new software to talk to one MSA SOFTWARE want. Instantly.

Call Robert Carpenter at Management And Information Expert is the fourth gen- Science America, Inc. 404-239-2000. He's also

